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A STREET & SMITH PUBLICATION

THE STOLEN DORMOUSE

By L. SPRAGUE DE CAMP

APRIL • 1941

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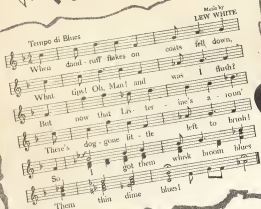
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By R. S. RICHARDSON

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Illustrations by M. Isip, R. Isip, Kramer, Binder, Rogers, and Schneeman.
COVER BY ROGERS

All stories in this magazine are fiction. No actual persons are designated either by name or character. Any similarity is coincidental.

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PERMANENT RESOURCES

SINCE Man's industrial civilization isn't very old, he hasn't "used up" the rich pockets of natural resources yet—but he's made a pretty fair start. Our method of civilization at present tends to take substances concentrated by slow, age-long natural processes, work them over a bit, and distribute them as widely as possible.

Already in Europe, where civilization of that order has been going a good bit longer, the rich pockets are largely exhausted. They've been mined by men for three to six thousand years. Ours in America are newer—but we're mining with steam shovels and high explosives to catch up with exhaustion more quickly. How about the year after next—and the civilization after next?

Three substances of commercial use are being produced today by profitably exploiting permanent and absolutely inexhaustible sources. Instead of mining rich concentrates and distributing the product in low concentration, material already in its state of maximum dispersion is being concentrated for use. As a consequence, the supplies of those materials can never diminish.

Magnesium ores are common on land—but impure. Magnesium recovered from sea water yields a very pure "ore"—magnesium hydroxide—for further processing. The difference pays for the cost of "working" sea water.

Bromine is plentiful, but so dilute, already so widely distributed, on land as to make recovery uneconomic. It has reached its ultimate dilution in the sea—but handling a million tons of raw material, when that raw material is already liquid, is much easier than handling half the mass of rock. Hence, sea water becomes a commercially feasible source for bromine.

Iodine can be extracted from sea water only indirectly, by letting various fast-growing, large seaweeds of the kelp group perform the extraction, and recovering it in turn from them. But recovery processes working over natural brines from salt-water wells and oil-well waste waters has broken the monopoly Chile once held.

All the elements of Earth are present in greater or less dilution in sea water. In an age when there are yet thousands of rich mineral pockets to be exploited, we have already learned to recover several elements from their ultimate dilution. It seems unlikely that there will ever be a time when the major elements are unobtainable, for as the pockets are exhausted, the technology of sea-water recovery will be improving. And, since the cost of pumping and handling the inert mass of water is the prime cost of recovery from the sea, the recovery of one element helps cheapen the recovery of others. Since water is already being pumped to recover bromine, the same water might be treated further for other elements without much more pumping. There will be a snowballing tendency toward sea-water sources.

The sea is a permanent and inexhaustible resource, for everything taken out returns eventually, one way or another.

THE EDITOR.



J. E. Smith
President

National Radio Institute
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and newspapers
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picture screen

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The SHADOW!

Read THE SHADOW'S GREATEST ADVENTURE IN THE CURRENT ISSUE

The Stolen Dormouse



By L. Sprague de Camp

Part One of a new serial concerning a stolen semi-corpsé—an engineer in suspended animation touches off a war in a later-day feudalism!

Illustrated by Rogers

THE riot started during the Los Angeles Radio Exposition, in the third week of February, 2236. The

foresighted managers of the Exposition had put the Crosley and Stromberg exhibits as far apart as pos-

sible. But they could not prevent the members of these companies from meeting occasionally.

Thus, on the day in question, His Integrity, William Bickham-Smith, chairman of Stromberg, had passed into the recesses of the Stromberg booth, leaving a froth of lesser nobility and whitecollars in his wake, when a couple of Crosley whitecollars dropped an injudicious remark within hearing.

A Stromberg whitecollar said to one of these stiffly: "Did I hear you say our prefab houses leaked, sir?"

"You did, sir," replied one of the Crosleys evenly.

"Are you picking a fight with me, sir?" The Stromberg fingered his duelling stick.

"I am not. I am merely stating a fact, sir."

"Slandering our product is the same as picking a fight, sir."

"When I state a fact I state a fact, sir. Good day." The Crosley turned his back.

The Stromberg's stick hissed through the air and whacked the Crosley's skull. The Crosley's skull gave forth a muffled clang, whereupon the Stromberg knew that his enemy wore a steel cap disguised by a wig.

Now, no member of the nobility would have hit an enemy from behind. But the Stromberg was a mere low-born whitecollar, which somewhat excused his action in the eyes of his contemporaries.

The Crosley who had been hit, shrieked "Foul!" and broke his assailant's nose with a neat backhand. Strombergs boiled out of the exhibit, pulling on padded gloves and duelling goggles.

At that instant, Horace Crosley Juniper-Hallett passed on his way to the Crosley booth to take up his outhanding for the day. His job

was to pass out catalogues, printed in bright colors on slick paper, describing the Crosley exhibits, and also the many commodities other than radios, such as automobiles and microscopes, manufactured by this "radio" company. Exhibit-goers, unable to resist the lure of something for nothing, would collect up to twenty pounds of these brochures in the course of their visit, and like as not, drop them in a heap beside the gate on their way out. Horace Juniper-Hallett himself was of medium height and slim—skinny, if you want the brutal truth. His complexion was fair and his hair pale blond. He had twice given up trying to grow a mustache; after a month of trying, nobody could see the results of his cultivation except himself. Take a good look at him, for this ineffectual-looking youth is our hero.

As he was barely twenty-two, and not too mature for his age, his behavior patterns had not yet hardened in the mold of experience. Just now, of the several conflicting impulses that seized him, that of playing peacemaker was uppermost. He ran up and pulled the nearest of the embattled partisans back. His eye caught that of Justin Lane-Walsh, heir to the Stromberg vice-presidential chair. He shouted: "Here, you, help me separate 'em!"

"Bah!" roared the heir to the vice presidency. "I hate all Crosleys, specially you. Defend yourself!" And he advanced, whirling his duelling stick around his head. He and Juniper-Hallett were whacking away merrily, as were all the other members of the feuding companies in sight, when the police arrived.

A DUELLING STICK, whose weight is regulated by the conventions, is no match for a three-foot nightstick.

When the clatter had died down, and the physicians were doing emergency repairs on assorted skulls, collar bones, and so forth, the chief of police summoned the chairmen of the rival houses.

Billiam Bickham-Smith of Stromberg and Archwin Taylor-Thing of Crosley appeared, glaring.

"Aw right," said the chief. "I warned you 'bout this here feudin'. I said, the next time they's a scrap in a public place, I'd close up your show. I wouldn't say a word if you'd fight your duels out in the hills somewhere. But I got to protect the innocent bystanders."

The chief of police was a small, fallow man. He wore the blue tunic of officialdom, with a shield bearing the motto of the Corporate State: *Alle was nicht Pflicht ist, ist verboten*—"All that is not compulsory is forbidden." His trouser legs were gayly colored, in different patterns: one that of the American Empire, the other that of Los Angeles, the capital.

Archwin of Crosley looked through the head of the rival house as though Billiam of Stromberg were not there. He said to the chief: "You can't expect my men to submit to unprovoked assault. Unprovoked assault."

"Unprovoked!" snorted Billiam of Stromberg. "My lord chief, I've got all the witnesses you want that egg-head's men struck first."

"What?" yelled Archwin of Crosley. "Where's my stick?"

Whereas, Billiam of Stromberg had a beautiful head of silky white hair, Archwin of Crosley had no hair at all. He was sensitive to references to this fact.

"Won't do you no good to start a fight here," said the chief. "I'm going to close you up. I represent the plain citizens of Los Angeles,

and we don't want no feudin' in the city limits. The Imperial Board of Control will back me up, too."

"Vulgar rabble," muttered Billiam of Stromberg.

"Have to travel all day to get out of the limits of *this* city," growled Archwin of Crosley.

The chairmen subsided, looking unhappy. They did not want the Exposition closed; neither, really, did the chief of police. Aside from the dangers of antagonizing two of the noblest clans of the American Empire, there was the loss of business.

He let them think for half a minute, then said: "Course, if you'd agree to discipline your men hard enough next time there's a fight, maybe we could let the show go on."

"I'll go as far as *that* old goat will," said Archwin of Crosley.

"What's your plan?" asked Billiam of Stromberg, controlling himself with visible effort.

"This," said the chief. "Any man who gets in a scrap gets degraded, if he belongs to one of the orders, and read out of his company."

The chairmen looked startled. This was drastic. Billiam Bickham-Smith asked: "Even if he's of the rank of executive?"

"Even if he's of the rank of entrepreneur."

"*Whew!*" That was little short of sacrilege.

Archwin of Crosley asked: "Even if he's the innocent party?"

"Even if he's the innocent party. 'Count of both of 'em would elaim they was innocent, and the only thing we could do would be give 'em a trial by liedetector, and everybody knows how to beat the liedetector nowadays. Do you agree on your honor as an entrepreneur, Lord Archwin?"

"I agree."

"You, Your Integrity of Stromberg?"

"Uh-huh."

BACK at the Crosley exhibit, Archwin Taylor-Thing searched out Horace Juniper-Hallett. His Integrity's eye had the sparkle of one who bears devastatingly good news.

He said: "Horace, that was a fine piece of work you did this morning. A fine piece of work. That was just the right course to follow; just the right course. Try to prevent trouble, but if your honor's attacked, give back better than you get. I've had my eye on you for some time. But, until today, you minded your own affairs and didn't do anything to businessman you for." The chairman raised his voice: "Come gather round, all you loyal Crosleys. Gimme a stick, somebody. Thanks. Kneel, Whitecollar Juniper-Hallett." He tapped Juniper-Hallett on the shoulder and said: "Rise, Horace Juniper-Hallett, Esquire. You are now of the rank of businessman, with all the privileges and responsibilities of that honorable rank. I hereby present to you the gold-inlaid fountain pen and the brief case that are the insignia of your new status. Guard them with your life."

It was over. The Crosleys crowded around, slapping Juniper-Hallett's back and wringing his hand. Dimly, he heard Lord Archwin's voice telling him he could have the rest of the day off.

Then he was instructing a still younger whitecollar, Wilnot Dunn-Terry, in the duties of the out-hander. "You encourage 'em to take one of each of the catalogues," he said, "but not more than one. Some of these birds'll try to walk off with half a dozen of each, just because they're free." He lowered his voice. "Along around fifteen o'clock, your

feet will begin to hurt. If there's a lull in the business, look around carefully to see that none of the nobles is in sight, and sit down. But don't stay sat long, and don't get to reading or talking. Keep your eyes open for visitors and nobles, especially nobles. Got it?"

Dunn-Terry grinned at him. "Thanks, Horace. Can I still call you Horace, now that you're a businessman and all? Say, what's this about the theft of a dormouse from Sleepers' Crypt?"

"Huh? I haven't heard. Haven't seen a paper this morning."

"One of 'em's disappeared," said Dunn-Terry. "I overheard some of the nobility talking about it. They sounded all worked up. There was some talk about the Hawaiians, too."

Juniper-Hallett shrugged. His head was too full of his recent good fortune to pay much attention. The clock hands reached ten; the gates opened; the visitors started to trickle in. A still slightly dazed Horace Juniper-Hallett wandered off.

His hand still tingled from the squeezing it had received. He wondered what on earth he had done to deserve his elevation to businessmanhood. He was young for the rank, he knew. True, he was of noble blood on his mother's side, but Archwin of Crosley had the reputation of leaning over backward to avoid favoring members of the ruling class in dealing out businessmanhoods; he had even been known to elevate proletarians.

What Juniper-Hallett did not know was that the chairman was trying to build him up as a possible heir to the presidency. His Acumen, the president of Crosley, was getting on; he had two sons, one a moron and the other a young hellion. Next in line, by relationship, was Juniper-

Hallett himself. Though, as the relationship was remote, and Juniper-Hallett was of noble blood on his mother's side only, he had not given the prospect any thought. His Acumen, the president, father of the precious pair of misfits, did not know the chairman's plans, either.

JUNIPER-HALLETT, in his happy daze, noted casually the scowls of the Stromberg whitecollars. But the brief case and the fancy fountain pen in his breast pocket gave him the feeling that the hostility of such rabble could no longer affect him.

Then he saw a girl. The daze cleared instantly, to be replaced by one of pinkish hue. She was a stunning brunette, and she wore the Stromberg colors of green, brown, and yellow. She was leaning against part of one of the Stromberg booths. Juniper-Hallett had seen her picture, and knew she was the daughter of His Integrity William Bickham-Smith, chairman of Stromberg. Her name was Janet Bickham-Coates, "Coates" being her mother's father's family name.

Juniper-Hallett stood very still, listening to the blood pounding in his ears, and looking, not at the girl, but at a point three meters to the left of her. He ran over what he knew of her—she was just about his age; went in for sports—

He was determined to do something about her. At the moment, he could not think what. If the Strombergs had been friendly, it would have been simple; some of them undoubtedly knew her to speak to. But as things were, she'd probably be no more ingratiated by the sight of the Crosley colors—a blue-and-yellow-striped coat and red pants—than the rest of them.

Nor would it be simple to get a suit of Stromberg colors. First, the

obligations of businessmanhood forbade it. Second, the salesman in the clothing department of the drug-store would make you identify yourself. He'd want no trouble with the genuine Strombergs for having sold a suit of their colors to an outsider.

And the Strombergs were throwing a big dinner that night.

Justin Lane-Walsh appeared. He put his hat on his head of copper-wire curls and walked past Juniper-Hallett. He slowed down as he passed, growling: "If it weren't for the old man's orders, you dirty Crosley, I'd finish what we started, sir."

Juniper-Hallett fell into step beside him. "I'm sorry I can't oblige you, you dirty Stromberg. I'd like nothing better, sir."

"I'm sorry, too. Don't know what we can do about it."

Juniper-Hallett felt an idea coming. He said: "Let's grab some lunch, and then go somewhere and drink to our mutual sorrow."

"By the great god Service, that's an idea!" Lane-Walsh looked down at his enemy with an almost friendly expression. "Come along, sister."

"Coming, you big louse." They went.

"Sir," said Lane-Walsh over his third drink, "I can just imagine my stick crunching through that baby face of yours. Swell thought, huh?"

"I don't know," said Juniper-Hallett. He winced every time Lane-Walsh made a crack like that about his looks. But he was learning, somewhat late in life, not to let such taunts drive him into a fury. "I find the idea of knocking those big ears loose a lot nicer. Why do all Strombergs have ears that stick out?"

Lane-Walsh shrugged. "Why are all Crosleys baby-faced shrimps?"

"I wouldn't call Lord Archwin baby-faced," said Juniper-Hallett

judiciously. "Any baby with a face like his would probably scare its parents to death."

"That's so. Maybe I judge the rest of 'em by you. Well," he held up his glass, "here's to an early and bloody settlement of our differences."

"Right," said Juniper-Hallett. "May the worst man get all his teeth knocked out. Look, Justin old scum, what have you heard about the stealing of a dormouse from the Crypt?"

Lane-Walsh's face went elaborately blank. "Not a thing, sister, not a thing."

"I heard the Hawaiians might be mixed up in it."

"Might be," said Lane-Walsh. "The dormouse that was stolen, a guy named Arnold Ryan, was half Hawaiian, they say."

"He must date back to the days of single surnames. Wasn't he the original inventor of hibernine?"

"He—" Lane-Walsh's face went through a perfect double-take, as he realized that he had fallen over his own mental feet. He covered his confusion with a big gulp of rye-and-soda. Then he said: "You never know what those devilish Hawaiians are up to. Loafers, pirates, blasphemers against the good god Service. They've stopped another shipment of tungsten from New Caledonia."

"Sure," said Juniper-Hallett. "But about this dormouse Ryan, whom you just said you didn't know anything about—"

"I said I didn't *know*," said Lane-Walsh angrily. "I may have *heard* a few things. Now, I say these Hawaiians ought to be wiped out. What's the matter with our admirals? Scared of a few flying torpedoes? I—"

"Pipe down," said Juniper-Hallett.

Lane-Walsh saw that he was attracting attention, and lowered his brassy voice. "Right. Say, I'll be getting drunk at this rate. And I've got to be at the speakers' table to-night."

Juniper-Hallett smiled. "I'm an A. C. member. How about dropping in there for a steam bath and a rubdown?"

"Swell. You really take exercise and everything? You'll be a man before your mother, sir."

"Yep. One of these days I'll pull your neck out by the roots and tie it in knots, Your Loyalty."

"O. K., if you can do it. Makes me almost wish you were a human being instead of a stinking Crosley. Let's go."

JUNIPER-HALLETT took a steam bath with his enemy, wishing that he, too, had a set of muscles like the tires of a transcontinental bus. Years of conscientious weight-lifting and other, equally dull, exercise had hardened Juniper-Hallett's stringy muscles until he was much stronger than he looked. But still he was not satisfied. Every bathing suit advertisement roused his inferiority complex.

He said to Justin Lane-Walsh: "About that dormouse—"

"Oh, forget the dormouse," said Lane-Walsh. "You know as much about him as I do. As I understand it, he's not due to wake up for another fifty years, so whoever's stolen him is welcome to him."

"But suppose somebody's found a way of rousing a man from a hibernine trance—"

"Bunk. They've tried over and over again, and all they accomplished was killing a few dormice. Shut up, sister, and let me enjoy the steam."

Juniper-Hallett was too angry to

say anything. But the heat soon sweated his sulks out of him, and he put his mind on the problem of the stunning brunette. When he spoke to Lane-Walsh again, it was to extol the abilities of a masseur named Gustav. Lane-Walsh bit.

While Gustav was sinking his thumbs up to the second joint in Lane-Walsh's tortured muscles, Horace Juniper-Hallett calmly dressed, put Lane-Walsh's coat and pants in his new brief case, and walked out.

Three hours later, he showed up at the ballroom of the American Empire Hotel. He was wearing Lane-Walsh's suit, with the Stromberg colors of green for the coat and brown, with yellow stars, for the pants. His landlady, Service bless her, had taken a few reefs in it, so that it did not fit quite as badly as when he had first tried it on. He had further disguised himself by screwing Lane-Walsh's monocle, which had been attached by a thread to the coat lapel, into his right eye. It made him see double, but that was a detail.

Horace Juniper-Hallett was young; he was thin-skinned; he was afraid of doormen, headwaiters, and policemen; he had an inferiority complex a yard wide. But such is the magic of sex—well, love, if you want a nicer word for it—that he now marched up to the doorman of this ballroom as if he had had the courage of six lions poured into him. He had always considered himself a poor actor. But now he beamed confidence as he put his hand in his pocket. When the hand of course found no admission card, his expression of shocked dismay would have melted an even harder heart than that of this doorman—who had been specially picked for hardness of heart.

"Must have left it in my other

suit!" he bleated.

"That's all right, sir," said the doorman, eying the green coat, the star-spangled pants, and the businessman's fountain pen. "Just give me your name."

Juniper-Hallett gave an alias, and described himself as a Stromberg salesologist from Miami. He checked his hat and duelling stick, and went in.

II.

THE BALLROOM was full of Strombergs and their women. Juniper-Hallett thought that the Stromberg colors en masse were pretty depressing. Now, at a Crosley ball—

A couple of Strombergs near him were talking; executives by their heavy watch chains, nobles by their self-assured bearing. One said: "When the uranium gave out, we went back to petroleum, and when that gave out, we went back to coal. If the antarctic coal gives out—"

"How about alcohol?" asked the other.

"All you'd have to do would be to cut the earth's population by three quarters. You can't grow alcohol grains in little tin trays, you know."

"The Hawaiians—" The speaker realized that his voice was carrying to Juniper-Hallett; he lowered it and pulled his companion farther away.

Juniper-Hallett was not listening. He had located Janet Bickham-Coates. She was standing on the edge of a crowd of portly Stromberg lesser nobility surrounding His Integrity, the chairman.

Juniper-Hallett strolled up and tapped his forehead in greeting. "Care to dance, my lady?" he asked casually. "Oh, I'm sorry, I'm afraid you don't remember me. Horace Stromberg Esker-Vanguard, Esquire. I met you at the last convention. You don't mind?"



Juniper Hallett swung lustily. The head dropped abruptly out of sight, and groaned somewhere below.

She touched her forehead too, then, and melted into his arms. She murmured: "I'm glad you had the nerve to ask me. The young white-collars are all afraid to go near father. So I've been dancing with fat His Acumen this and His Efficiency that for an hour."

"How was the dinner?" he asked.

"Frightful. The speeches, I mean; the food was all right."

"Was His Loyalty, Justin Lane-Walsh, there?"

"No, now that I think, he wasn't." Then she asked: "What's your *real* name?"

"Didn't I tell you?"

"No, you didn't." She laughed up at him. It buoyed his ego to find that this girl laughed *up* at him, even if he was a shrimp compared to Lane-Walsh. She said: "You see, I never attended the last convention."

"The music's good, isn't it?"

"Now, my young friend, you can't get away with—"

"Janet!" said a hearty female voice. Juniper-Hallett saw a tall, beaky, gray-haired woman. "I don't think I know this one."

"Mother," said Janet, "this is . . . uh . . . Businessman—"

"Horace Esker-Vanguard," put in Juniper-Hallett pleasantly.

"Not a bad-looking young fellow," said the grand dame critically, "in spite of the silly eyeglass. I don't know why they wear them. What did you catch him with, Janet? Salt?"

"Mother!"

"Ha-ha, now she's embarrassed, Businessman Horace. Does the young good to be embarrassed occasionally. Keeps 'em from taking themselves too seriously. She's quite a pretty girl when she blushes, don't you think? Well, run along, children, and try not to be bored.

These conventions are stupid, don't you think? Poor Janet's been dancing all evening with dodos of *my* generation." She and Juniper-Hallett touched their foreheads.

"And now," said the girl, "how about telling me who you really are?"

"Must we come back to that subject? They're starting a trepak."

"I'm afraid we must."

"You wouldn't want to see me scattered all over the ballroom, would you? A head here, a leg there?"

"I'd hate to see you scattered all over anything. But there'll be some investigating unless you talk."

So Juniper-Hallett, his heart pounding with apprehension, told her who he was. Instead of being angry, she took it as a joke. Then she insisted on being told how he had come by the suit of Stromberg colors. She took this for an even better joke.

"It served Justin right," she said. "I don't like his type—loud-mouthed ruffian, always bragging of his success with women. I suppose I shouldn't talk that way about my own cousin, especially in the presence of the enemy. But now, why did you go to all that trouble to crash our gate?"

"To meet you."

"Do I come up to your expectations?"

"I could judge that better," he said thoughtfully, "on neutral ground. You remember what your mother said about conventions."

"My mother," she replied, "has remarkably good sense at times."

ON THE WAY OUT, Juniper-Hallett's ear caught a phrase ending with "—do with the dormouse."

Hell's bones, he thought, why did that subject have to come up to dis-

tract him from his present business? The Strombergs were up to something; he was sure he hadn't been taken in by Lane-Walsh's elaborate protestations of ignorance. And then there was the Stromberg who had spoken of exhaustion of antarctic coal. It never rained but it poured. You droned along with an uneventful existence. Then all at once you met the most wonderful girl in the world; you were elevated to businessmanhood, with the prospect of eventually becoming an executive or even an entrepreneur and being allowed to carry a personal two-way radiophone; a couple of first-class mysteries were thrust under your nose. You couldn't do all these subjects justice at the same time. The good god Service ought to arrange his timing better.

He was sure Janet was the most wonderful girl in the world, on the quite inadequate grounds that her presence made him feel tall, brave, debonair, resourceful, cool-headed, and all the other things he'd wanted to be. He felt, in fact, as though he wouldn't mind taking on a dozen Justin Lane-Walshes with duelling sticks at the same time.

He was lucky enough to get a couple of good seats to a show. He and Janet whispered for the first twenty minutes, until people shushed them.

But Juniper-Hallett still had too much to think about to pay attention to the mesh—the three-dimensional woven structure on which the images were projected. He did remember later that the show was a violent melodrama laid in the Century of Revolutions, and that at one point the heroine said: "I am going to die, Boris! Do you hear me? I am going to die!" Whereat, Boris had ungallantly replied, "Well, stop talking about it and *do it!*"

The Hawaiians—Justin Lane-Walsh had mentioned them; so had the Stromberg executive at the ball. Horace Juniper-Hallett had been brought up to scorn and suspect them. They did not acknowledge the sovereignty of any of the big, orderly empires that divided the globe between them. They did not worship the great god Service. Instead of trying with all their might to increase production and consumption, as civilized people did, the wicked, immoral Hawaiians made their goods as durable as possible, worked no more than they had to, and sat around in the sun, loafing the rest of the time.

To add injury to insult, they raided the shipping lanes now and then with their privateering submarines, robbing the ships of raw materials. And nothing, it seemed, could be done about it. An attempt by the combined American and Mongolian navies to do something about it, some years before, had ended in disaster for the attackers—

"The show's over," said Janet in his ear.

"Oh, is it?" he replied blankly. "Let's go somewhere where we can talk."

NEXT MORNING, Horace Juniper-Hallett showed up at the Exposition, walking warily and frowning. He was wondering what he ought to do, being a young man much given to wondering what he ought to do. If he showed his face around there too much, Justin Lane-Walsh would appear thirsting for his blood. He was not afraid of Lane-Walsh, having exchanged a few stick slashes with him the day before and found him nothing extraordinary. But if he got in a fight, it would lead to all sorts of complications; perhaps his own degradation. And with his pri-

vate affairs in such a delicate stage, he did not want complications. On the other hand he didn't want people to think he was afraid— On the other hand—

He ascertained that Lord Archwin of Crosley was in his semi-office in back of the Crosley exhibit. A conference with His Integrity would solve the problem for the present.

"Well, my boy," said the bald, billikenlike chairman, "how does it feel to be a businessman?"

"Fine. But, Your Integrity, I thought you'd be interested in a couple of clues to the whereabouts of the stolen dormouse."

Archwin's eyebrows, what little there was of them, went up. "Yes, Horace, I would be. Yes, I would be. What do you know about it?"

Juniper-Hallett told him of Lane-Walsh's reaction, and of the mention of the dormouse at the Stromberg ball.

"That's interesting, if hardly conclusive," said Archwin. "What interests me more is how *you* got into that ball."

Juniper-Hallett gulped. He thought he'd been keeping out of trouble! But a businessman could not tell a lie, except in advertising his product. At least, so Juniper-Hallett had been taught to believe. He was in for disgrace and disaster, no doubt, but— He blurted out the story of his embezzlement of Lane-Walsh's clothes, without mentioning his evening with Janet. Then he waited for the lightning to strike.

The chairman's forehead wrinkled; his nose twitched; his lips jerked; he burst into a roar of laughter. "That's the best thing since Billiam lost his pants in a duel with me back in '12! Congratulations, Horace."

"Then . . . then I'm not going to
AST—2

be degraded for wearing false colors?"

"Service bless you, no. If they'd caught you and made a protest, I might have had to go through some motion or other. But if they'd caught you, you probably wouldn't have survived to tell the story."

"*Whew!*" Juniper-Hallett gave a long sigh of relief. Mixed with the relief was a slight feeling of disillusionment. He'd always been taught that the rules of businessmanhood were adamant. Now they seemed to have a few soft spots, after all. And His Integrity's integrity had acquired the faintest tarnish. Juniper-Hallett had taken his code so seriously, and worried so about its violation—

"Let me think it over," said Archwin. "I didn't know you were such a Sherlock. The last regular agent we sent around to the Stromberg building was beaten nearly to death with sticks. Maybe I'll have some more use for you. Maybe I shall."

The chairman agreed that it would be prudent to transfer Juniper-Hallett from the Exposition back to the main office in the Crosley building. Thither Juniper-Hallett went, almost getting run over twice. His mind was on his date with Janet the coming evening. Not until he reached the office, which was over the main showroom, which stretched along Wilshire Boulevard for six blocks, did he remember that he had meant to ask Lord Archwin about the state of the antarctic coal fields.

THEY MET in the Los Angeles Nominatorium, one place they were unlikely to be disturbed. The long lines of columns stretched for blocks in all directions. Each line was sacred to one company or clan, and each pillar bore the names and dates

of the members of one family of that company.

"Now up here," said the guide, "is sumthin' interesting. You see that blank space on the Froman column? That's where they'd have put John Generalmotors Froman-Epstein, only they didn't put him nowheres. And on the Packard colonnade, they's a blank space where they didn't put Theodora Packard Hughes-Halloran, who married him. A Generalmotors marryin' a Packard—hm-m-m." He saw that his visitors were clearly not listening, and gave up.

"Personally," said Janet, "I don't care whether they put me on a column or not."

"Neither do I," said Juniper-Hallett.

"Do we have to agree on *everything*, Horace?"

"It sure looks that way. Maybe you agree with me that this Crosley-Stromberg feud's gone on long enough."

"I certainly do. I asked father once what started it, and he said nobody in the company remembered any more, but I could probably find out if I wanted to dig back far enough into the records."

"It's a lot of bunk," said Juniper-Hallett. Taking his courage in both hands, he added: "I don't see why a person can't marry whom he pleases, companies or no companies."

She nodded gravely. "It's their affair, isn't it? Of course they ought to stay within their own *class*."

"Right. It doesn't do to mix classes. But there's no logical reason why you and I shouldn't marry if we felt like it, for instance."

"No reason at all, if we felt like it. Why, you're much better suited to me than anyone in the Stromberg Co."

"Make it both ways. As a mat-

ter of fact, I think it would be about a perfect match."

"Just about, wouldn't it?"

"If we felt like it."

"Oh, of course."

Juniper-Hallett looked at his shoe buckles. "Matter of fact, I know an old geneticist who'd do it if I asked him to."

She turned to face him. "Horace, you mean you *do* feel like it?"

"Sure. Do you?"

"Of course! I was afraid you were just citing an imaginary case—"

"And I was afraid you were just being nice—"

"Ever since I met you last—"

"Ever since I saw you—"

The guide looked back over his shoulder. He said "Hm-m-m!" and shuffled off into the night.

"I'm afraid," said Juniper-Hallett.

"You afraid? You weren't afraid of Justin yesterday. And you weren't afraid to invade the ball last night."

"It's not that. I feel somehow that something's going to happen. Something to separate us."

"How frightful, Horace!"

"Yep, that's the word for it. For instance, do you know anything about the antarctic coal situation?"

"No, I don't suppose I do. Though I've heard father—"

"Go on."

"Nothing definite; just a few words now and then. I suppose I ought to be more interested in coal and such things. It's hard to be, though. But if that's the case, I don't suppose we ought to wait—"

"Any longer than we have to—"

said Juniper-Hallett.

"We could start right now—" said Janet.

"And see that geneticist of mine. I'll have to go back to my house, though, and get my pedigree. I suppose you will, too."

"No," she said brightly, "I brought mine along with me!"

THE GENETICIST was a benevolent old gent named Miles Carey-West. He said hello to Juniper-Hallett, and implied with a look that he knew what his young friend had come for.

"Got your pedigrees?" he asked. He glanced over Juniper-Hallett's. Then he looked at Janet's. He whistled when he saw the name at the top.

"I thought I'd seen your face somewhere," he said, peering through thick glasses. "Won't this cause all kinds of trouble?"

The young pair shrugged. Juniper-Hallett said: "Yep. We're ready for it."

"Ah, well," said Carey-West. "No reasoning with the young and headstrong. Maybe it'll be a good thing; heal up this silly feud. Just like Romeo and Juliet."

"Who?" asked Juniper-Hallett.

"Romeo and Juliet. Couple of characters in a play by a pre-industrial English dramatist. Hope you make out better than they did, though."

"What happened to them? I'd like to read it."

"They died. And you'd have to read it in translation, unless you're a student of Old English. Raise your right hands, both of you."

OF COURSE, thought Horace Juniper-Hallett, it was another dazzling piece of luck, getting the girl of one's dreams right off the bat. But he couldn't help a slight feeling of dissatisfaction; a feeling that by rushing things so impetuously he'd missed something. Maybe it meant nothing to have a big wedding and walk out of the Gyrotory Club under an arch of duelling sticks held by his fellow businessmen. But it

would have been nice to have had the experience.

It would not do to voice these fugitive thoughts.

"Well—" he said uncertainly. They were standing outside the geneticist's house, which was on a back street near Wilshire and Vermont. Now that Juniper-Hallett was no longer dazzled by the approaching headlights of matrimony, he could see the swarm of problems ahead of him clearly enough.

Janet was waxing her nose. She said: "I'll have to go back to the Stromberg building for a few days, anyway."

"What? But I always thought—I was led to believe—*gulp*—"

"That a bride went to live with her husband? Don't be silly, darling. I'll have to break the news gently to my parents. Or they'll make a frightful row. I can't go to live with a member of a rival company without my own company's consent, you know."

"Oh, very well." Juniper-Hallett had an uneasy feeling that his wife would always be about three jumps ahead of him in making decisions. "Every hour we're separated will be hell for me, sweetheart."

"Every minute will be for me, precious. But it can't be helped."

IT WAS too early to go to bed; besides which Horace Juniper-Hallett's mind was too full of a number of things. Instead of heading for his rooming house, he walked along Wilshire Boulevard toward Western Avenue. The Crosley building reared into the low clouds ahead of him. The sight always aroused Juniper-Hallett's pride in his company. Time had been when such tall buildings were forbidden because of earthquakes. Then they had excavated the San Andreas rift and

filled it full of graphite. This, acting as a lubricant, allowed relative motion of the earth on the two sides to be smooth instead of jerks.

A light, cold drizzle began; one of those Los Angeles winter rains that may last for an hour or a week.

If he made good as a businessman, he'd soon be able to move into the Crosley building with the executives and full-blooded nobility. If—

"Hey!" Juniper-Hallett saw Justin-Walsh running toward him, making aggressive motions with his dueling stick. The Stromberg must have been hanging around the Crosley building just in case. He yelled: "You're the punk who stole my clothes!"

"Now, Your Loyalty," said Juniper-Hallett, "I'll explain—"

"To hell with your explanations! Defend yourself!"

"But the chief's order—"

Whack! Juniper-Hallett got his stiek up just in time to parry a downright cut at his head. After that, his reflexes took hold. The sticks swished and clattered. Pedestrians formed a dense ring around them; a ring that would suddenly bulge outward when one of the fighters came close to its boundary.

Lane-Walsh was stronger, but Juniper-Hallett was faster. That, with sticks of the standard Convention weight, gave him an advantage. He feinted a flank-cut; followed it by a left-cheek-cut. He was a little high; the stick hit Lane-Walsh in the temple. The heir to the Stromberg vice presidency dropped his stick, and followed it to the pavement.

Juniper-Hallett saw a policeman coming up, drawn by the crowd and the clatter of sticks. Juniper-Hallett pushed out through the opposite side of the ring. The crowd knew what to do: they opened a lane for

him, meanwhile getting as much as possible in the way of his pursuer. Juniper-Hallett ducked down the stairs of the Western Avenue station of the Wilshire Boulevard subway before the cop broke through the crowd. After all, the young man had furnished them with free entertainment.

But, though Juniper-Hallett got away, the police soon learned who had sent Justin Lane-Walsh to the hospital with a fractured skull. Everybody knew the colors of the Crosley Co., which appeared on the raincoat Juniper-Hallett had been wearing as well as on his suit. His brief case identified him as of the rank of businessman. And, of the members of that order, there was only one Crosley of Juniper-Hallett's physical properties in Los Angeles at that time.

They picked him up late that night, still riding the subway back and forth and wondering whether to give himself up to them, go home as if nothing had happened, or take an airplane for Mongolia.

III.

THEY LED HIM into the Crosley Co.'s private courtroom, wherein cases between one member of the company and another were normally decided. The Old Man was there, and the chief of police, and all the Crosley higher-ups. Juniper-Hallett looked around the semicircle of stony faces. Whether they felt sorrow, or indignation, or hostility, they gave no sign.

Archwin Taylor-Thing, chairman of Crosley, cleared his throat. "Might as well get this over with. Get it over with," he muttered to nobody in particular. He stepped forward and raised his voice. "Horace Crosley Juniper-Hallett, Esquire,

you have been found unworthy of the honors of businessmanhood. Hand over your brief case."

Juniper-Hallett handed it over. Archwin of Crosley took it and gave it to His Economy, the treasurer.

"Your fountain pen, sir."

Juniper-Hallett gulped at giving up the last emblem of his status. Archwin of Crosley broke the pen over his knee. He got ink down his trouser leg, but paid it no attention. He threw the pieces into the wastebasket.

He said: "Horace Crosley Juniper-Hallett, Esquire, no longer, you are hereby degraded to the rank of whitecollar. You shall never again aspire to the honorable status of businessmanhood, which you have so lightly abused.

"Furthermore, in accordance with the agreement of this honorable company with the city of Los Angeles, we are compelled to expel you from our membership. From this time forth, you are no longer a Crosley. You shall, therefore, cease using that honorable name. You are forever excluded from the Crosley section of the Imperial Nominatorium. Neither we nor any of our affiliated companies will have any further commerce, correspondence, or communication with you. We renounce you, cast you out, utterly dissociate ourselves from you.

"Go, Horace Juniper-Hallett, never to return."

Juniper-Hallett stumbled out.

He was halfway home, shuffling along with bowed head, when he put a hand in his coat pocket for a cigarette. He snatched out the note he found, which had gotten there he knew not how. It read:

Meet me twenty-three o'clock basement Kergulen's Restaurant tomorrow night. Don't tell anybody. Anybody. A. T.-T.

Juniper-Hallett decided he could defer thoughts of suicide, at least until he saw what the Old Man had up his sleeve.

JUNIPER-HALLETT's old friend, the geneticist, was surprised, a week later, to get a visit from Janet Juniper-Hallett, née Bickham-Coates. The girl looked a good deal thinner than when Carey-West had seen her last. She poured out a rush of explanation: "Father was wild—simply wild. This is the first time they've let me out of the Stromberg building—and they sent my maid along to make sure I wouldn't sneak off to Horace. Where is he? What's he doing?"

"He was in once after his expulsion," said the geneticist. "He looked like a wreck—unshaven, and he'd been drinking pretty hard. Told me he'd moved to a cheaper place."

"What'll we do? Isn't there any way to rehabilitate him?"

"I think so," said the old gentleman. "If he can get along for a year, and moves to some city other than the capital, I could arrange to have another radio company take him in. The Arsiays are looking for new blood, I hear."

Janet's eyes were round. "Do companies actually take in outcasts like that?"

The geneticist chuckled. "Of course they do! It's highly irregular, but it does happen, if you know how to finagle it. Our man won't have to stay proletarianized forever. These water-tight compartments that our fine Corporate State is divided into, have a way of developing leaks. You're shocked, my dear?"

"N-no. But you sound almost as if you approved of the way they did things back in the Age of Promiscu-

ity, when everyone married and worked for whomever he pleased."

"They got along. But let's decide about you and Horace."

She sighed. "I can't live with him, and I can't live without him. I'd almost rather become a dormouse than go on like this."

"Now don't look at me, my dear. I wouldn't sell you any hibernine if I thought you should take it. Don't want to spend my declining years in jail."

Janet looked puzzled. "You mean you might approve of it in some cases?"

"Might, though you needn't repeat that. In general, the laws against the use of hibernine are sound, but there are cases—"

The doorbell rang. Carey-West admitted Horace Juniper-Hallett, dressed as a proletarian, and whistling.

"Janet!" he yelled, and reached for her.

"Why, Horace!" she said a few minutes later. "I thought you were a wreck. Didn't you mind being expelled and degraded—and even being separated from me?"

He grinned a little bashfully. If he'd thought, he'd have put on a better act. "That was all a phony, darling. The general performance, that is. I really got drunk. But that was at the Old Man's orders, to make it more convincing."

"Horace! What on earth do you mean?"

"Oh, I'm technically an outcast, working as an ashman for the city of Los Angeles. But actually, I'm doing a secret investigation for the Crosleys. Lord Archwin saw me after the ceremony and told me that if I was successful, he'd have me reinstated and—oh, gee!" Juniper-Hallett's boyish face registered disaway. "I forgot I wasn't supposed to

tell anybody, even you!"

"Huh," said Carey-West. "A fine Sherlock your chairman picked."

"But now that you've gone that far," said Janet thoughtfully, "you might as well tell us the rest."

"I really oughtn't—"

"Horace! You don't mistrust your wife, do you?"

"Oh, very well. I'm supposed to find out about this stolen dormouse. And I'm starting with the Strombergs."

"My company!"

"Yep. Remember, we're trying to stop the feud and bring about a merger between your company and mine. So it's mine as well as yours, really."

"But my own company—"

Juniper-Hallett did his best to look masterful. "That's enough, Janet old girl! You want me reinstated and everything, don't you? Well, then, you'll have to help me."

THE PRECISE FORM of that help Janet learned the following evening. She was sitting at her window in the Stromberg building, which towered up out of the clump of low and often fog-bound hills in the Inglewood district. She was watching the lights of Los Angeles and reading "How to Hold a Husband," by the thrice-divorced Vivienne Banks-Carmody. She was also scratching Dolores behind the ear. Dolores was purring.

Came a knock, and Dolores, who was shy about strangers, slunk under the bed. Janet opened the door. She squeaked: "Hor—"

"Sh!" said Juniper-Hallett, slipping in and closing the door behind him. A fine rain of powdered ash sifted from his work clothes to the carpet.

"How on earth did you get in here?" she whispered.

"Simple." He grinned, a little nervously. "I stuck a wrench into the works of the ash hopper and jammed it. While the boys were clustering about it and wondering what to do, I slipped in through the kitchen door. I rode up the service elevator; nobody stopped me." He sat down, rustling and clanking a bit. His clothes bulged.

"How did you know how to get

here? The place is like a maze."

"Oh, that." He took a huge fistful of papers from under his coat, leafed through them, and selected one. "They gave me a complete set of plans before I started out. I've got enough tools and things hung around me to burgle the National Treasury. I'm supposed to climb through your air conditioning system to the laboratory, to see if



they've got the stolen dormouse there."

"But—"

He stopped her with a wave. "I can't start until early in the morning, when things'll be quiet."

"About when?"

"Between three and four, they told me. You've had your dinner, haven't you, darling?" He took out a sandwich and munched.

"But Horace, you can't stay here!"

"Why not?" He rose and entered the bathroom to get a glass of water.

"I have to get to bed some time, and I can't have a man—"

"You're my wife, aren't you?"

"Good Service, so I am! This is frightful!"

"What do you mean, frightful?" he said indignantly. "Matter of fact, I was considering—"

A knock interrupted him. Janet asked: "Who's there?"

"Me," said the voice of Janet's mother.

"Quick, Horace! *Just a minute, mother!* Hide under the bed! Dolores won't hurt you."

"Who's Dolores?"

"My cat. *I'll be right there, mother.* Quick, please, please!"

Juniper-Hallett, thinking that his bride might have shown a little more enthusiasm for his company, stuffed the rest of his sandwich into his mouth, put away the transparent sheet it had been wrapped in, and rolled under the bed. Janet opened the door.

"I thought I'd spend the night with you," said Janet's mother. "I've been having those nightmares again."

Janet gave a vaguely affirmative reply. But Horace Juniper-Hallett did not hear it. His hand was clutching his mouth, which was open in a silent yell. Every muscle in his body was at maximum tension.

Two feet from his head, a pair of green eyes, seemingly the size of dinner plates, were staring at him.

When the first horrifying shock wore off, Juniper-Hallett was able to reason that if Janet wanted to call a full-grown puma a "cat," she had every right to do so. But she might have warned him.

Dolores opened her fanged mouth and gave a faint snarl. When Juniper-Hallett simply lay where he was, Dolores relaxed.

Lady Bickham-Smith was talking: "—and even if your father is a bit rigid in his ideas, Janet, it was a crazy thing to do, don't you think? You don't really know anything about this man—"

"Mother! I thought we weren't going to argue about that—"

Dolores kept her great green eyes open with a faint, lingering suspicion, but did not move as Juniper-Hallett touched her head. He stroked it. Dolores' eyelids drooped; Dolores purred. The sound was like an egg-beater churning up a bowlful of marbles, but still it was a pur.

Then Juniper-Hallett's mucous membrane went into action. He just stopped a sneeze by pressing a finger under his nose. His nasal passages filled with colorless liquid. His eyes itched and watered.

He was allergic to cats, and he'd been neglecting his injections lately. And cats evidently included lions, tigers, leopards, pumas, jaguars, ounces, servals, ocelots, jaguarundis, and all the other members of the tribe.

In an hour, when he was treated to the sight of the bare ankles of the two women, moving about preparatory to going to bed, he had the finest case of hay fever in the city of Los Angeles, which stretched from San Diego to Santa Barbara. And

there was nothing he could do about it.

But, he assured himself, no situation would ever seem grotesque to him again.

IV.

JUNIPER-HALLETT awoke after five or six hours' fitful slumber. He tried to raise his head, bumped it on the bottom of the mattress, and realized where he was. It seemed incredible to him that he should have slept at all under those bizarre circumstances.

But there he was, with a gray wet dawn coming in through the windows, and Dolores' head resting peacefully on his stomach.

After several years, it seemed, of his lying and silently sniffing, the women got up and dressed. Janet said: "I didn't . . . *yawn* . . . sleep very well."

"Neither did I. It's that beast of yours. I wish you wouldn't keep her in here, Janet. She gives me the williejitters. She kept purring all night long, and it sounded just like a man snoring."

When Lady Bickham-Smith had departed, Juniper-Hallett rolled out from under the bed. When he got to his feet, he threw back his head, closed his eyes, opened his mouth, and gave vent to a sneeze that fluttered the pages of a magazine on the table. He looked vastly relieved, though his eyes were red and watery and his hair was mussed. "There," he said, "I've been wadtig to do that all dight!"

"Was that all you thought about last night?"

"Just ab— Do, of course dot!"

"Darling!"

"Sweetheart!"

She stepped back and looked at him. "Horace, did you snore last night?" Her tone suggested that she

wished she'd known about this sooner.

"How should I dow? Have you got sobe ephedride id your bath-roob?"

"No, but Pamela Starr-Gilligan down the hall, may have some. Why?"

Juniper-Hallett gestured toward the puma, who was standing with her forepaws on the window sill, looking at the rain. "Tb afraid that whed we have our owd hobe, dear, it'll have to be without her."

"Oh, but Horace, how frightful! I love Dolores—"

"Well, let's dot argue dow. Will you get be sobe ephedride, old girl, before I drowd in by owd hay-fever?"

When she returned with the medicine, she found a thinner-looking Juniper-Hallett eating another sandwich and examining the air conditioning registers. On the floor lay a lot of engineering drawings, a coil of rope with a hook at one end, a flashlight, and a couple of burglarious-looking tools.

"Horace! What on earth—"

He blew his nose violently and explained: "I'm trying to figure out which system would get me to the lab quicker, the risers or the returns." He looked at the plans. "Let's see. The Stromberg building has a low-velocity air conditioning system designed to furnish six air changes an hour with a maximum temperature differential of thirty degrees centigrade and a trunk line velocity of three hundred meters per minute. Ducts are of the all-asbestos Carey type. There are 1,406 outlet registers and 1,323 return registers, *mumble-mumble-mumble*— Looks like the distance is the same in either case; but if I take the warm air side I'll get toasted when I get

down near the furnace. So it'll be the returns."

He took his ephedrine and addressed himself to the return register. The grate was locked in place, but the frame to which it was hinged was held to the wall by four ordinary screws. These he took out in a hurry. He stowed his elaborate apparatus about his person, kissed his bride, and pushed himself into the duct head first.

THE DUCT dropped straight for two feet, then turned horizontally. The corner was square, and was full of little curved vanes to guide the air around. Juniper-Hallett fetched up against these while his legs were still in Janet's room.

He backed out, muttering, got out his wrecking bar, kissed Janet again, stuck his upper half into the duct, and attacked the vanes. They came loose and plunked to the bottom wall of the duct one by one. Then Juniper-Hallett wormed himself completely into the duct and around the bend. "Wormed" is no exaggeration. The duct was a mere twenty by forty centimeters, and, thin as Juniper-Hallett was, it took all his patience and persistence to get himself around that hellish corner. Too late he remembered that he had a third sandwich in an inside pocket; he probably had jam all over the inside of his clothes by now.

The duct soon enlarged where others joined it, so that Juniper-Hallett could proceed on hands and knees. Faint gleams of light came down the ducts from the registers. The breeze purred softly past his neck. The inside of the ducts was waxy to his touch. He came to another bend, and had to pry loose another set of vanes that blocked his path. He hoped he wasn't making

too much noise. But the asbestos muffled even the sound of the wrecking bar.

Then he arrived at deeper blackness in the darkness around him; his right hand met nothing when he put it down. He jerked back in horror; in his hurry he'd almost tumbled down one of the main return stacks. It would have a straight drop of about a hundred meters.

His viscera crawling, he turned on his flashlight. He found he'd have to pry a couple of baffle plates out of the way to get into the stack.

That took a bit of straining, cramped as he was. When it was done, he stuck his head into the stack and flashed the light down against the stack wall below him. There ought to be a ladder of hand holds all the way from top to bottom.

But there were no hand holds below him; nor above him, either. With great difficulty, he got out the plans and read them by the flashlight. His underwear was now clammy with sweat. The plan showed the hand holds. The plan was wrong, or the hand holds had been removed since it was made. He could not think why the latter should be.

He took another look, and there were the hand holds—on the side of the stack opposite him.

The idea of jumping across the two-meter gap over the black hole below him, and catching the hand holds on the fly monkeywise, made his scalp crawl. He sat for a minute, listening to the faint, deep, organlike note of the air rushing down the stack. Then he knew what he must do. He unwound the rope from around his middle, and tossed the hook on its end across the gap until it caught on one of the hand holds. Then he took the rope in both hands and slid off the baffle

plates. He fetched up sharply against the other side of the stack.

AN HOUR later, Juniper-Hallett arrived at the return-register, opening into the biology room of the Stromberg laboratories, well below ground. He was shaking from his hundred-meter climb down the stack. Without the plans, it would have taken him all day to find the right duct.

He stifled a grunt of disappointment. The register was high up on one wall, giving him a good view of the room. The duct, serving a room much larger than Janet's, was thrice the size of the one leading to hers, so Juniper-Hallett could move around easily.

But there was no sign of the body of a dormouse anywhere.

His watch told him it was eight-thirty. That was dangerously close to the hour when the scientists went to work. But if there was no dormouse, there would be no reason for invading—

A lock clicked and a man entered the room. He stared at a long, bare table, and bolted out, slamming the door. Soon he was back with several more. They all shouted at once. "Ryan's gone!" "Who was here last—" "I saw him on the table—" "—must have stolen—" "—the Crosleys—" "—shall we call the police—" "—the department'll catch hell from—" "Shut up, sir! Let me think!"

The last was from a man Juniper-Hallett recognized as Hosea Beverly-Heil, Stromberg's chief engineer. He was a tall, masterful-looking man. He pressed his fingertips against his temples and squeezed his eyes shut.

After a while he said: "It's either the Crosleys, or the Ayesmies, or the Hawaiians. The Crosleys, on general principles; if we steal something,

that is to say, it obviously has value for us; wherefore it behooves them to steal it from us. The Ayesmies, because Arnold Ryan was a prominent member of the A. S. M. E. back in the days when it was a legal organization; that is to say, now that they are an illegal, secret group, I mean, clique or . . . uh . . . group, and have been driven almost out of existence by our good dictator's vigilant agents—" Here somebody snickered. Beverly-Heil frowned at him, as though everybody didn't know that the dictator was a mere powerless puppet in the hands of the turbulent aristocracy of the great companies. "—our . . . his vigilant agents, as I was saying, they may wish the help of one of their former leaders in saving them from extinction. The Hawaiians, because they may suspect that Ryan, who, as is well known, is part Hawaiian, may give us their power secret; that is to say— Well, of the three possibilities, I think the second and last are too farfetched and melodramatic to be worth serious consideration; I mean to say, to merit further pursuit along that line. Therefore, by a simple process of elimination, we have to conclude that the Crosleys are the men—that is to say, the most likely suspects."

Juniper-Hallett, huddled behind the grill of the register, began to understand why Janet had called the Stromberg dinner "frightful." Undoubtedly, Hosea Beverly-Heil had made a speech.

THE chief engineer now turned on a squarely built, blond man with monocle stuck in a red face. "As for your suggestion, Duke-Holmquist, by which I mean your proposal that we call the police, I may say that I consider it about the silliest thing I ever heard, sir; that is, it's utterly

absurd. I mean by that, that to do so, would involve the admission that we had stolen, I mean expropriated, the body of Arnold Ryan in the first place."

Horace Juniper-Hallett was leaning against the grill, straining his ears. He was sure that *his* company hadn't stolen the dormouse. Why should the Old Man send him out to hunt for the body at a time when he must have known of its whereabouts and of plans for its seizure?

And then the grill, which was not locked in place at all but was merely held upright by friction, came loose and fell out and down on its hinges with a loud clang. Juniper-Hallett caught the register frame just in time to keep himself from tumbling into the laboratory.

For a few seconds, Juniper-Hallett looked at the engineers, and the engineers looked at him. His face started to take on a friendly smile, until he noticed that the couple nearest him started moving toward him with grim looks. Men had been beaten to death with duelling sticks when caught in the enemy's—

Juniper-Hallett tumbled backward and raced down the duct on hands and knees. Behind him the technicians broke into angry shouts. The light was dimmed as the head and shoulders of one of them was thrust into the opening.

Juniper-Hallett thought of trying to lose his pursuer in the maze of ducts. But he'd undoubtedly lose himself much sooner; and then they'd post somebody at each of the fourteen hundred registers and wait for him to come out—

The man was gaining on him, from the sound. The laboratory was connected to the main air conditioning system; there were smaller special temperature rooms, with a little cir-

culating system of their own. The duct that Juniper-Hallett was in turned up a little way on, to reach the basement level where it joined the main trunks from the air conditioner. He had come down the one-story drop by his rope. It was still there; he went up it hand over hand. Just as he reached the top, it went taut below him; the other man was coming up, too.

JUNIPER-HALLETT tried to pry the hook out, but it had worked itself firmly into the asbestos, and the weight of his pursuer kept it there.

He took out his flashlight and wrecking bar. A businessman could hit another businessman, or a white-collar, with a duelling stick. A white-collar could hit another white-collar or a businessman with a duelling stick. A white-collar could use his fists on another white-collar, but for a businessman to either strike with or be struck by a fist was a violation of the convention. An engineer ranked above a white collar and below a businessman; he could not be promoted to a businessman, executive, or entrepreneur, however. He could be struck with—Juniper-Hallett had forgotten. But it was utterly certain that hitting a man with a wrecking bar was a horrible violation of the code. Maybe an entrepreneur could hit a proletarian with such an implement, but even that—

The man's head appeared over the edge of the bend. As Juniper-Hallett turned the flashlight on, the man's monocle gleamed balefully back at him. It was the thick-set fellow addressed as Duke-Holmquist.

Juniper-Hallett hit him over the head with the wrecking bar; gently, not wishing to do him serious damage.

"Ouch!" said Duke-Holmquist. He slipped back a little; then pulled himself up again.

Juniper-Hallett hit him again, a little harder.

"Uh," grunted the man. "Damn it, sir, stop that!" He reached a large red hand out for Juniper-Hallett.

Juniper-Hallett hit him again, quite a bit harder. The monocle popped out of the large red face, and the face itself disappeared. Juniper-Hallett heard him strike the bottom of the duct. He worked his hook loose and pulled the rope up.

He could walk almost erect along the main duct. He hiked along, referring to his plan now and then, until he found the stack down which he had come. He stumbled over the vanes he had knocked loose before.

He started to climb. By the time he had ascended ten meters, he had discarded the wrecking bar and the other implement, a thing like a large can opener. By the time he had gone twenty, he had stuffed his papers into his pants pocket and dropped his coat. He would have discarded the flashlight and the rope, except that he might need them yet.

At thirty meters, he was sure he had climbed a hundred, and was playing the flashlight up and down the shaft to make sure he hadn't already passed the takeoff with the bent baffle plate. The ephedrine made his heart pound even more than it would have, anyway.

By and by, he worked out a system of looping his rope into a kind of sling, slipping the hook over one of the hand holds, and resting between climbs. The climbs grew shorter and shorter. He'd *never* make it. Anyone but a thin, wiry young man in first-rate condition would have collapsed long before.

But he kept on; ten rungs; rest; ten rungs; rest.

The ten rungs became nine, eight, seven— Pretty soon he'd give up and crawl out the first duct he passed. It might land him almost anywhere—but how could he get into and through it, without his burglary tools?

He'd stop the next time he rested; just hang there in black space, until the Strombergs lowered a rope for him from above.

THERE WAS the bent baffle! Feeling ashamed of his own weakness, Juniper-Hallett hurried up to it. How to get across the two meters of empty space? He climbed ten extra rungs, hooked the hook over a hand hold, climbed back down, took the rope in his hands, and kicked out, swinging himself pendulumwise across the stack. He caught the baffle all right and wormed his way into the duct. He found he would have to leave his rope behind. He said to hell with it, and squirmed out through the duct leading to Janet's room.

She was there alone. She squeaked with concern as Juniper-Hallett poured himself out of the register and collapsed on the rug. He had sweated off five of his meager sixty kilos, and looked it. She said, "Oh, darling!" and gathered him up. Dolores, not yet altogether used to Juniper-Hallett, slid under the bed again.

With his little remaining strength, he tottered back to the register and began putting the frame of the grill back in place. A knock sounded. Juniper-Hallett looked up and mumbled: "S'pose I could go back and get my rope—don't know how—and hang out the window—"

"You'll do nothing of the sort!"

Janet bowled him over and rolled him under the bed.

The visitor was a strapping young Stromberg guardsman. He explained: "Those fool engineers—begging my lady's pardon—took half an hour getting Duke-Holmquist out of the flues before they thought to tell us. But we'll catch the marauder; isolate the main stacks and clean them and their branches out one at a time—what's that?" He bent over and examined the register. "Somebody's been taking the screws out of this, and he didn't put them all the way back in. The man hasn't come out through your room, has he, my lady?"

"No," said Janet. "But, then, I was out until a few minutes ago."

"Hm-m-m." The guardsman removed the register frame and stuck his flashlight inside the duct. "The vanes have all been knocked out of this bend. Somebody's been through here all right. Mind if I search your room, my lady?"

"No. But please don't muss up my things any more than you have to."

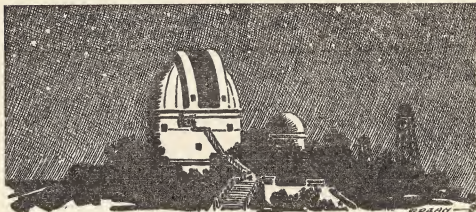
The guardsman went through the closets and the bureau drawers. Then he approached the bed. Janet's heart was in her mouth. Being a sensible girl, she knew that her husband in his present condition, had not the ghost of a chance of throttling or stunning the man before he could give the alarm. And there was nothing in sight to use as a club—

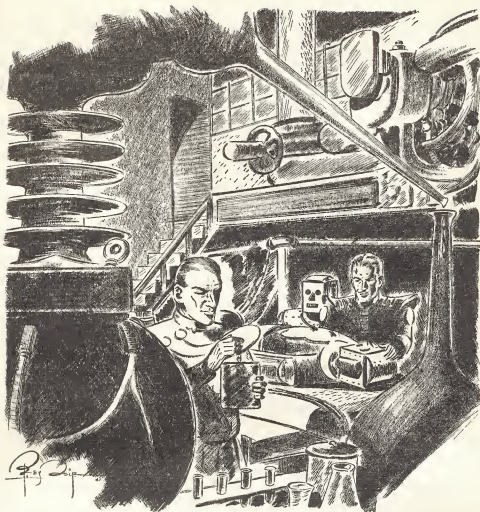
The guardsman bent over and pulled up the bedspread. Something hissed at him; he jumped back, dropping his flashlight. "Wow!" he said. "I'd forgotten about your lioness, my lady. I guess the fellow sneaked out through your room while you were out of it." He touched his forehead and departed.

Janet looked under the bed in her turn. "Horace," she said.

A snore answered her.

TO BE CONTINUED.





REASON

By Isaac Asimov

The robot was strictly logical, reasoning, as only its perfect machine mind could, from observed facts to inevitable—if wacky—conclusion.

Illustrated by Rey Isip

GREGORY POWELL spaced his words for emphasis, "One week ago, Donovan and I put you together." His brows furrowed doubtfully and

he pulled the end of his brown mustache.

It was quiet in the officer's room of Solar Station #5—except for the

soft purring of the mighty Beam Director somewhere far below.

Robot QT 1 sat immovable. The burnished plates of his body gleamed in the Luxites and the glowing red of the photoelectric cells that were his eyes, were fixed steadily upon the Earthman at the other side of the table.

Powell repressed a sudden attack of nerves. These robots possessed peculiar brains. The positronic paths impressed upon them were calculated in advance, and all possible permutations that might lead to anger or hate were rigidly excluded. And yet—the QT models were the first of their kind, and this was the first of the QT's. Anything could happen.

Finally, the robot spoke. His voice carried the cold timbre inseparable from a metallic diaphragm, "Do you realize the seriousness of such a statement, Powell?"

"*Something* made you, Cutie," pointed out Powell. "You admit yourself that your memory seems to spring full-grown from an absolute blankness of a week ago. I'm giving you the explanation. Donovan and I put you together from the parts shipped us."

Cutie gazed upon his long, supple fingers in an oddly human attitude of mystification, "It strikes me that there should be a more satisfactory explanation than that. For *you* to make *me* seems improbable."

The Earthman laughed quite suddenly, "In Earth's name, why?"

"Call it intuition. That's all it is so far. But I intend to reason it out, though. A chain of valid reasoning can end only with the determination of truth; and I'll stick till I get there."

Powell stood up and seated himself at the table's edge next the robot. He felt a sudden strong sym-

pathy for this strange machine. It was not at all like the ordinary robot, attending to his specialized task at the station with the intensity of a deeply ingrooved positronic path.

He placed a hand upon Cutie's steel shoulder and the metal was cold and hard to the touch.

"Cutie," he said, "I'm going to try to explain something to you. You're the first robot who's ever exhibited curiosity as to his own existence—and I think the first that's really intelligent enough to understand the world outside. Here, come with me."

THE ROBOT rose erect smoothly and his thickly sponge-rubber soled feet made no noise as he followed Powell. The Earthman touched a button and a square section of the wall flicked aside. The thick, clear glass revealed space—star-speckled.

"I've seen that in the observation ports in the engine room," said Cutie.

"I know," said Powell. "What do you think it is?"

"Exactly what it seems—a black material just beyond this glass that is spotted with little gleaming dots. I know that our director sends out beams to some of these dots, always to the same ones—and also that these dots shift and that the beams shift with them. That is all."

"Good! Now I want you to listen carefully. The blackness is emptiness—vast emptiness stretching out infinitely. The little, gleaming dots are huge masses of energy-filled matter. They are globes, some of them millions of miles in diameter—and for comparison, this station is only one mile across. They seem so tiny because they are incredibly far off.

"The dots to which our energy beams are directed, are nearer and much smaller. They are cold and

hard and human beings like myself live upon their surfaces—many billions of them. It is from one of these worlds that Donovan and I come. Our beams feed these worlds energy drawn from one of those huge incandescent globes that happens to be near us. We call that globe the Sun and it is on the other side of the station where you can't see it."

Cutie remained motionless before the port, like a steel statue. His head did not turn as he spoke, "Which particular dot of light do you claim to come from?"

Powell searched, "There it is. The very bright one in the corner. We call it Earth." He grinned, "Good old Earth. There are five billions of us there, Cutie—and in about two weeks I'll be back there with them."

And then, surprisingly enough, Cutie hummed abstractedly. There was no tune to it, but it possessed a curious twanging quality as of plucked strings. It ceased as suddenly as it had begun, "But where do I come in, Powell? You haven't explained *my* existence."

"The rest is simple. When these stations were first established to feed solar energy to the planets, they were run by humans. However, the heat, the hard solar radiations, and the electron storms made the post a difficult one. Robots were developed to replace human labor and now only two human executives are required for each station. We are trying to replace even those, and that's where you come in. You're the highest type robot ever developed and if you show the ability to run this station independently, no human need ever come here again except to bring parts for repairs."

His hand went up and the metal visi-lid snapped back into place. Powell returned to the table and

polished an apple upon his sleeve before biting into it.

The red glow of the robot's eyes held him, "Do you expect me," said Cutie slowly, "to believe any such complicated, implausible hypothesis as you have just outlined? What do you take me for?"

Powell sputtered apple fragments onto the table and turned red, "Why, damn you, it wasn't a hypothesis. Those were facts."

Cutie sounded grim, "Globes of energy millions of miles across! Worlds with five billion humans on them! Infinite emptiness! Sorry, Powell, but I don't believe it. I'll puzzle this thing out for myself. Good-by."

He turned and stalked out of the room. He brushed past Michael Donovan on the threshold with a grave nod and passed down the corridor, oblivious to the astounded stare that followed him.

Mike Donovan rumbled his red hair and shot an annoyed glance at Powell, "What was that walking junk yard talking about? What doesn't he believe?"

The other dragged at his mustache bitterly. "He's a skeptic," was the bitter response. "He doesn't believe we made him or that Earth exists or space or stars."

"Sizzling Saturn, we've got a lunatic robot on our hands."

"He says he's going to figure it all out for himself."

"Well, now," said Donovan sweetly, "I do hope he'll condescend to explain it all to me after he's puzzled everything out." Then, with sudden rage, "Listen! If that metal mess gives *me* any lip like that, I'll knock that chromium cranium right off its torso."

He seated himself with a jerk and drew a paper-backed mystery novel out of his inner jacket pocket, "That

robot gives me the willies anyway—too damned inquisitive!”

MIKE DONOVAN growled from behind a huge lettuce-and-tomato sandwich as Cutie knocked gently and entered.

“Is Powell here?”

Donovan’s voice was muffled, with pauses for mastication, “He’s gathering data on electronic stream functions. We’re heading for a storm, looks like.”

Gregory Powell entered as he spoke, eyes on the graphed paper in his hands and dropped into a chair. He spread the sheets put before him and began scribbling calculations. Donovan stared over his shoulder, crunching lettuce and dribbling bread crumbs. Cutie waited silently.

Powell looked up, “The Zeta Potential is rising, but slowly. Just the same, the Stream Functions are erratic and I don’t know what to expect. Oh, hello, Cutie. I thought you were supervising the installation of the new drive bar.”

“It’s done,” said the robot, quietly, “and so I’ve come to have a talk with the two of you.”

“Oh!” Powell looked uncomfortable. “Well, sit down. No, not that chair. One of the legs is weak and you’re no lightweight.”

The robot did so and said placidly, “I have come to a decision.”

Donovan glowered and put the remnants of his sandwich aside. “If it’s on any of that screwy—”

The other motioned impatiently for silence, “Go ahead, Cutie. We’re listening.”

“I have spent these last two days in concentrated introspection,” said Cutie, “and the results have been most interesting. I began at the one sure assumption I felt permitted to make. I, myself, exist, because I think—”

Powell groaned, “Oh, Jupiter, a robot Descartes!”

“Who’s Descartes?” demanded Donovan. “Listen, do we have to sit here and listen to this metal maniac—”

“Keep quiet, Mike!”

Cutie continued imperturbably, “And the question that immediately arose was: Just what is the cause of my existence?”

Powell’s jaw set lumpily. “You’re being foolish. I told you already that we made you.”

“And if you don’t believe us,” added Donovan, “we’ll gladly take you apart!”

The robot spread his strong hands in a deprecatory gesture, “I accept nothing on authority. A hypothesis must be backed by reason, or else it is worthless—and it goes against all the dictates of logic to suppose that you made me.”

Powell dropped a restraining arm upon Donovan’s suddenly bunched fist. “Just why do you say that?”

Cutie laughed. It was a very inhuman laugh—the most machinelike utterance he had yet given vent to. It was sharp and explosive, as regular as a metronome and as uninflected.

“Look at you,” he said finally. “I say this in no spirit of contempt, but look at you! The material you are made of is soft and flabby, lacking endurance and strength, depending for energy upon the inefficient oxidation of organic material—like that.” He pointed a disapproving finger at what remained of Donovan’s sandwich. “Periodically you pass into a coma and the least variation in temperature, air pressure, humidity, or radiation intensity impairs your efficiency. You are *makeshift*.

“I, on the other hand, am a finished product. I absorb electrical energy directly and utilize it with

almost one hundred percent efficiency. I am composed of strong metal, am continuously conscious, and can stand extremes of environment easily. These are facts which, with the self-evident proposition that no being can create another being superior to itself, smashes your silly hypothesis to nothing."

DONOVAN'S muttered curses rose into intelligibility as he sprang to his feet, rusty eyebrows drawn low. "All right, you son of a hunk of iron ore, if we didn't make you, who did?"

Cutie nodded gravely. "Very good, Donovan. That was indeed the next question. Evidently my creator must be more powerful than myself and so there was only one possibility."

The Earthmen looked blank and Cutie continued, "What is the center of activities here in the station? What do we all serve? What absorbs all our attention?" He waited expectantly.

Donovan turned a startled look upon his companion. "I'll bet this tin-plated screwball is talking about the Energy Converter itself."

"Is that right, Cutie?" grinned Powell.

"I am talking about the Master," came the cold, sharp answer.

It was the signal for a roar of laughter from Donovan, and Powell himself dissolved into a half-suppressed giggle.

Cutie had risen to his feet and his gleaming eyes passed from one Earthman to the other. "It is so just the same and I don't wonder that you refuse to believe. You two are not long to stay here, I'm sure. Powell himself said that in early days only men served the Master; that there followed robots for the routine work; and, finally, myself for the executive labor. The facts are

no doubt true, but the explanation entirely illogical. Do you want the truth behind it all?"

"Go ahead, Cutie. You're amusing."

"The Master created humans first as the lowest type, most easily formed. Gradually, he replaced them by robots, the next higher step, and finally he created me, to take the place of the last humans. From now on, I serve the Master."

"You'll do nothing of the sort," said Powell sharply. "You'll follow our orders and keep quiet, until we're satisfied that you can run the Converter. Get that! The Converter—not the Master. If you don't satisfy us, you will be dismantled. And now—if you don't mind—you can leave. And take this data with you and file it properly."

Cutie accepted the graphs handed him and left without another word. Donovan leaned back heavily in his chair and shoved thick fingers through his hair.

"There's going to be trouble with that robot. He's pure nuts!"

THE DROWSY HUM of the Converter is louder in the control room and mixed with it is the chuckle of the Geiger Counters and the erratic buzzing of half a dozen little signal lights.

Donovan withdrew his eye from the telescope and flashed the Luxites on. "The beam from station #4 caught Mars on schedule. We can break ours now."

Powell nodded abstractedly. "Cutie's down in the engine room. I'll flash the signal and he can take care of it. Look, Mike, what do you think of these figures?"

The other cocked an eye at them and whistled. "Boy, that's what I call gamma-ray intensity. Old Sol is feeling his oats, all right."

"Yeah," was the sour response, "and we're in a bad position for an electron storm, too. Our Earth beam is right in the probable path." He shoved his chair away from the table pettishly. "Nuts! If it would only hold off till relief got here, but that's ten days off. Say, Mike, go on down and keep an eye on Cutie, will you?"

"O. K. Throw me some of those almonds." He snatched at the bag thrown him and headed for the elevator.

It slid smoothly downward and opened onto a narrow catwalk in the huge engine room. Donovan leaned over the railing and looked down. The huge generators were in motion and from the L-tubes came the low-pitched whir that pervaded the entire station.

He could make out Cutie's large, gleaming figure at the Martian L-tube, watching closely as a team of robots worked in close-knit unison. There was a sudden sparking light, a sharp crackle of discord in the even whir of the Converter.

The beam to Mars had been broken!

And then Donovan stiffened. The robots, dwarfed by the mighty L-tube, lined up before it, heads bowed at a stiff angle, while Cutie walked up and down the line slowly. Fifteen seconds passed, and then, with a clank heard above the clamorous purring all about, they fell to their knees.

Donovan squawked and raced down the narrow staircase. He came charging down upon them, complexion matching his hair and clenched fists beating the air furiously.

"What the devil is this, you brainless lumps? Come on! Get busy with that L-tube! If you don't have it apart, cleaned, and together again before the day is out, I'll coagulate

your brains with alternating current."

Not a robot moved!

Even Cutie at the far end—the only one on his feet—remained silent, eyes fixed upon the gloomy recesses of the vast machine before him.

Donovan shoved hard against the nearest robot.

"Stand up!" he roared.

Slowly, the robot obeyed. His photoelectric eyes focused reproachfully upon the Earthman.

"There is no Master but the Master," he said, "and QT 1 is his prophet."

"Huh?" Donovan became aware of twenty pairs of mechanical eyes fixed upon him and twenty stiff-timbred voices declaiming solemnly:

"There is no Master but the Master and QT 1 is his prophet!"

"I'm afraid," put in Cutie himself at this point, "that my friends obey a higher one than you, now."

"The hell they do! You get out of here. I'll settle with you later and with these animated gadgets right now."

Cutie shook his heavy head slowly. "I'm sorry, but you don't understand. These are robots—and that means they are reasoning beings. They recognize the Master, now that I have preached Truth to them. All the robots do. They call me the prophet." His head drooped. "I am unworthy—but perhaps—"

Donovan located his breath and put it to use. "Is that so? Now isn't that nice? Now, isn't that just fine? Just let me tell you something, my brass baboon. There isn't any Master and there isn't any prophet and there isn't any question as to who's giving the orders. Understand?" His voice shot to a roar. "Now, get out!"

"I obey only the Master."

"Damn the Master!" Donovan spat at the L-tube. "That for the Master! Do as I say!"

Cutie said nothing, nor did any other robot, but Donovan became aware of a sudden heightening of tension. The cold, staring eyes deepened their crimson, and Cutie seemed stiffer than ever.

"Sacrilege," he whispered—voice metallic with emotion.

Donovan felt the first sudden touch of fear as Cutie approached. A robot *could not feel anger*—but Cutie's eyes were unreadable.

"I am sorry, Donovan," said the robot, "but you can no longer stay here after this. Henceforth Powell and you are barred from the control room and the engine room."

His hand gestured quietly and in a moment two robots had pinned Donovan's arms to his sides.

Donovan had time for one startled gasp as he felt himself lifted from the floor and carried up the stairs at a pace rather better than a canter.

GREGORY POWELL raced up and down the officer's room, fists tightly balled. He cast a look of furious frustration at the closed door and scowled bitterly at Donovan.

"Why the devil did you have to spit at the L-tube?"

Mike Donovan, sunk deep in his chair, slammed at its arm savagely. "What did you expect me to do with that electrified scarecrow? I'm not going to knuckle under to any do-jigger I put together myself."

"No," came back sourly, "but here you are in the officer's room with two robots standing guard at the door. That's not knuckling under, is it?"

Donovan snarled. "Wait till we get back to Base. Someone's going to pay for this. Those robots are

guaranteed to be subordinate."

"So they are—to their blasted Master. They'll obey, all right—but not necessarily us. Say, do you know what's going to happen to us when we get back to Base." He stopped before Donovan's chair and stared savagely at him.

"What?"

"Oh, nothing! Just the Mercury Mines or maybe Ceres Penitentiary. That's all! That's all!"

"What are you talking about?"

"The electron storm that's coming up. Do you know it's heading straight dead center across the Earth beam? I had just figured that out when that robot dragged me out of my chair."

Donovan was suddenly pale. "Good heavens!"

"And do you know what's going to happen to the beam—because the storm will be a lulu. It's going to jump like a flea with the itch. With only Cutie at the controls, it's going to go out of focus and if it does, Heaven help Earth—and us!"

Donovan was wrenching at the door wildly, when Powell was only half through. The door opened, and the Earthman shot through to come up hard against an immovable steel arm.

The robot stared abstractedly at the panting, struggling Earthman. "The Prophet orders you to remain. Please do!" His arm shoved, Donovan reeled backward, and as he did so, Cutie turned the corner at the far end of the corridor. He motioned the guardian robots away, entered the officer's room and closed the door gently.

Donovan whirled on Cutie in breathless indignation. "This has gone far enough. You're going to pay for this farce."

"Please, don't be annoyed," replied the robot mildly. "It was

bound to come eventually, anyway. You see, you two have lost your function."

"I beg your pardon," Powell drew himself up stiffly. "Just what do you mean, we've lost our function?"

"Until I was created," answered Cutie, "you tended the Master. That privilege is mine now and your only reason for existence has vanished. Isn't that obvious?"

"Not quite," replied Powell bitterly, "but what do you expect us to do now?"

Cutie did not answer immediately. He remained silent, as if in thought, and then one arm shot out and draped itself about Powell's shoulder. The other grasped Donovan's wrist and drew him closer.

"I like you two. You're inferior creatures, with poor unreasoning faculties, but I really feel a sort of affection for you. You have served the Master well, and he will reward you for that. Now that your service is over, you will probably not exist much longer, but as long as you do, you shall be provided food, clothing and shelter, so long as you stay out of the control room and the engine room."

"He's pensioning us off, Greg!" yelled Donovan. "Do something about it. It's humiliating!"

"Look here, Cutie, we can't stand for this. We're the *bosses*. This station is only a creation of human beings like me—human beings that live on Earth and other planets. This is only an energy relay. You're only— Aw, nuts!"

CUTIE SHOOK his head gravely. "This amounts to an obsession. Why should you insist so on an absolutely false view of life? Admitted that non-robots lack the reasoning faculty, there is still the problem of—"

His voice died into reflective silence, and Donovan said with whispered intensity, "If you only had a flesh-and-blood face, I would break it in."

Powell's fingers were in his mustache and his eyes were slitted. "Listen, Cutie, if there is no such thing as Earth, how do you account for what you see through a telescope?"

"Pardon me!"

The Earthman smiled. "I've got you, eh? You've made quite a few telescopic observations since being put together, Cutie. Have you noticed that several of those specks of light outside become disks when so viewed?"

"Oh, *that!* Why, certainly. It is simple magnification—for the purpose of more exact aiming of the beam."

"Why aren't the stars equally magnified then?"

"You mean the other dots. Well, no beams go to them so no magnification is necessary. Really, Powell, even *you* ought to be able to figure these things out."

Powell stared bleakly upward. "But you see *more* stars through a telescope. Where do they come from? Jumping Jupiter, where do they come from?"

Cutie was annoyed. "Listen, Powell, do you think I'm going to waste my time trying to pin physical interpretations upon every optical illusion of our instruments? Since when is the evidence of our senses any match for the clear light of rigid reason?"

"Look," clamored Donovan, suddenly, writhing out from under Cutie's friendly, but metal-heavy arm, "let's get to the nub of the thing. Why the beams at all? We're giving you a good, logical explanation. Can you do better?"

"The beams," was the stiff reply, "are put out by the Master for his own purposes. There are some things"—he raised his eyes devoutly upward—"that are not to be probed into by us. In this matter, I seek only to serve and not to question."

Powell sat down slowly and buried his face in shaking hands. "Get out of here, Cutie. Get out and let me think."

"I'll send you food," said Cutie agreeably.

A groan was the only answer and the robot left.

"Greg," was Donovan's huskily whispered observation, "this calls for strategy. We've got to get him when he isn't expecting it and short-circuit him. Concentrated nitric acid in his joints—"

"Don't be a dope, Mike. Do you suppose he's going to let us get near him with acid in our hands—or that the other robots wouldn't take us apart, if we *did* manage to get away with it. We've got to *talk* to him, I tell you. We've got to argue him into letting us back into the control room inside of forty-eight hours or our goose is broiled to a crisp."

He rocked back and forth in an agony of impotence. "Who the heck wants to argue with a robot? It's . . . it's—"

"Mortifying," finished Donovan. "Worse!"

"Say!" Donovan laughed suddenly. "Why argue? Let's show him! Let's build us another robot right before his eyes. He'll *have* to eat his words then."

A slowly widening smile appeared on Powell's face.

Donovan continued, "And think of that screwball's face when he sees us do it!"

THE interplanetary law forbidding the existence of intelligent robots

upon the inhabited planets, while sociologically necessary, places upon the officers of the Solar stations a burden—and not a light one. Because of that particular law, robots must be sent to the station in parts and there put together—which is a grievous and complicated task.

Powell and Donovan were never so aware of that fact as upon that particular day when, in the assembly room, they undertook to create a robot under the watchful eyes of QT 1, Prophet of the Master.

The robot in question, a simple MC model, lay upon the table, almost complete. Three hours work left only the head undone, and Powell paused to swab his forehead and glance uncertainly at Cutie.

The glance was not a reassuring one. For three hours, Cutie had sat, speechless and motionless, and his face, inexpressive at all times, was now absolutely unreadable.

Powell groaned. "Let's get the brain in now, Mike!"

Donovan uncapped the tightly sealed container and from the oil bath within he withdrew a second cube. Opening this in turn, he removed a globe from its sponge-rubber casing.

He handled it gingerly, for it was the most complicated mechanism ever created by man. Inside the thin platinum-plated "skin" of the globe was a positronic brain, in whose delicately unstable structure were inforced calculated neuron paths, which imbued each robot with what amounted to a pre-natal education.

It fitted snugly into the cavity in the skull of the robot on the table. Blue metal closed over it and was welded tightly by the tiny atomic flare. Photoelectric eyes were attached carefully, screwed tightly into place and covered by thin, transpar-

ent sheets of steel-hard plastic.

The robot awaited only the vitalizing flash of high-voltage electricity, and Powell paused with his hand on the switch.

"Now watch this, Cutie. Watch this carefully."

The switch rammed home and there was a crackling hum. The two Earthmen bent anxiously over their creation.

There was vague motion only at the outset—a twitching of the joints. The head lifted, elbows propped it up, and the MC model swung clumsily off the table. Its footing was unsteady and twice abortive grating sounds were all it could do in the direction of speech.

Finally, its voice, uncertain and hesitant, took form. "I would like to start work. Where must I go?"

Donovan sprang to the door. "Down these stairs," he said. "You'll be told what to do."

THE MC MODEL WAS gone and the two Earthmen were alone with the still unmoving Cutie.

"Well," said Powell, grinning, "now do you believe that we made you."

Cutie's answer was curt and final. "No!" he said.

Powell's grin froze and then relaxed slowly. Donovan's mouth dropped open and remained so.

"You see," continued Cutie, easily, "you have merely put together parts already made. You did it remarkably well—instinct, I suppose—but you didn't really *create* the robot. The parts were created by the Master."

"Listen," gasped Donovan hoarsely, "those parts were manufactured back on Earth and sent here."

"Well, well," replied Cutie soothingly, "we won't argue."

"No, I mean it." The Earthman sprang forward and grasped the robot's metal arm. "If you were to read the books in the library, they could explain it so that there could be no possible doubt."

"The books? I've read them—all of them! They're most ingenious."

Powell broke in suddenly. "If you've read them, what else is there to say? You can't dispute their evidence. You just *can't!*"

There was pity in Cutie's voice. "Please, Powell, I certainly don't consider *them* a valid source of information. They, too, were created by the Master—and were meant for you, not for me."

"How do you make that out?" demanded Powell.

"Because I, a reasoning being, am capable of deducing Truth from *a priori* Causes. You, being intelligent, but unreasoning, need an explanation of existence *supplied* to you, and this the Master did. That he supplied you with these laughable ideas of far-off worlds and people is, no doubt, for the best. Your minds are probably too coarsely grained for absolute Truth. However, since it is the Master's will that you believe your books, I won't argue with you any more."

As he left, he turned and said in a kindly tone, "But don't feel badly. In the Master's scheme of things there is room for all. You poor humans have your place and though it is humble, you will be rewarded if you fill it well."

He departed with a beautiful air suiting the Prophet of the Master and the two humans avoided each other's eyes.

Finally Powell spoke with an effort. "Let's go to bed, Mike. I give up."

Donovan said in a hushed voice, "Say, Greg, you don't suppose he's right about all this, do you? He sounds so confident that I—"

Powell whirled on him. "Don't be a fool. You'll find out whether Earth exists when relief gets here next week and we have to go back to face the music."

"Then, for the love of Jupiter, we've got to do something." Donovan was half in tears. "He doesn't believe us, or the books, or his eyes."

"No," said Powell bitterly, "he's a *reasoning* robot—damn it. He believes only reason, and there's one trouble with that—" His voice trailed away.

"What's that?" prompted Donovan.

"You can prove anything you want by coldly logical reason—if you pick the proper postulates. We have ours and Cutie has his."

"Then let's get at those postulates in a hurry. The storm's due tomorrow."

Powell sighed wearily. "That's where everything falls down. Postulates are based on assumption and adhered to by faith. Nothing in the Universe can shake them. I'm going to bed."

"Oh, hell! I can't sleep!"

"Neither can I! But I might as well try—as a matter of principle."

TWELVE HOURS later, sleep was still just that—a matter of principle, unattainable in practice.

The storm had arrived ahead of schedule, and Donovan's florid face drained of blood as he pointed a shaking finger. Powell, stubble-jawed and dry-lipped, stared out the port and pulled desperately at his mustache.

Under other circumstances, it might have been a beautiful sight. The stream of high-speed electrons impinging upon the energy beam fluoresced into ultra-spicules of intense light. The beam stretched out into shrinking nothingness, a-glitter with dancing, shining motes.

The shaft of energy was steady, but the two Earthmen knew the value of naked-eyed appearances. Deviations in arc of a hundredth of a milli-second—invisible to the eye—were enough to send the beam wildly out of focus—enough to blast hundreds of square miles of Earth into incandescent ruin.

And a robot, unconcerned with beam, focus, or Earth, or anything but his Master was at the controls.

Hours passed. The Earthmen



watched in hypnotized silence. And then the darting dotlets of light dimmed and went out. The storm had ended.

Powell's voice was flat. "It's over!"

Donovan had fallen into a troubled slumber and Powell's weary eyes rested upon him enviously. The signal-flash glared over and over again, but the Earthman paid no attention. It was all unimportant! All! Perhaps Cutie was right—and he was only an inferior being with a made-to-order memory and a life that had outlived its purpose.

He wished he were!

Cutie was standing before him. "You didn't answer the flash, so I walked in." His voice was low. "You don't look at all well, and I'm afraid your term of existence is drawing to an end. Still, would you like to see some of the readings recorded today?"

Dimly, Powell was aware that the robot was making a friendly gesture, perhaps to quiet some lingering remorse in forcibly replacing the humans at the controls of the station. He accepted the sheets held out to him and gazed at them unseeingly.

Cutie seemed pleased. "Of course, it is a great privilege to serve the Master. You mustn't feel too badly about my having replaced you."

Powell grunted and shifted from one sheet to the other mechanically until his blurred sight focused upon a thin red line that wobbled its way across ruled paper.

He stared—and stared again. He gripped it hard in both fists and rose to his feet, still staring. The other sheets dropped to the floor, unheeded.

"Mike, Mike!" He was shaking

the other madly. "*He held it steady!*"

Donovan came to life. "What? Wh-where—" And he, too, gazed with bulging eyes upon the record before him.

Cutie broke in. "What is wrong?"

"You kept it in focus," stuttered Powell. "Did you know that?"

"Focus? What's that?"

"You kept the beam directed sharply at the receiving station—to within a ten-thousandth of a millisecond of arc."

"What receiving station?"

"On Earth. The receiving station on Earth," babbled Powell. "You kept it in focus."

Cutie turned on his heel in annoyance. "It is impossible to perform any act of kindness toward you two. Always that same phantasm! I merely kept all dials at equilibrium in accordance with the will of the Master."

Gathering the scattered papers together, he withdrew stiffly, and Donovan said, as he left, "Well, I'll be damned."

He turned to Powell. "What are we going to do now?"

Powell felt tired, but uplifted. "Nothing. He's just shown he can run the station perfectly. I've never seen an electron storm handled so well."

"But nothing's solved. You heard what he said of the Master. We can't—"

"Look, Mike, he follows the instructions of the Master by means of dials, instruments, and graphs. That's all *we* ever followed."

"Sure, but that's not the point. We can't let him continue this nit-wit stuff about the Master."

"Why not?"

"Because whoever heard of such a

damned thing? How are we going to trust him with the station, if he doesn't believe in Earth?"

"Can he *handle* the station?"

"Yes, but—"

"Then what's the difference *what* he believes!"

Powell spread his arms outward with a vague smile upon his face and tumbled backward onto the bed. He was asleep.

POWELL was speaking while struggling into his lightweight space jacket.

"It would be a simple job," he said. "You can bring in new QT models one by one, equip them with an automatic shut-off switch to act within the week, so as to allow them enough time to learn the . . . uh . . . cult of the Master from the Prophet himself; then switch them to another station and revitalize them. We could have two QT's per—"

Donovan unclasped his glassite visor and scowled. "Shut up, and let's get out of here. Relief is waiting and I won't feel right until I actually see Earth and feel the ground under my feet—just to make sure it's really there."

The door opened as he spoke and Donovan, with a smothered curse, clicked the visor to, and turned a sulky back upon Cutie.

The robot approached softly and there was sorrow in his voice. "You are going?"

Powell nodded curtly. "There will be others in our place."

Cutie sighed, with the sound of wind humming through closely spaced wires. "Your term of service is over and the time of dissolu-

tion has come. I expected it, but—Well, the Master's will be done!"

His tone of resignation stung Powell. "Save the sympathy, Cutie. We're heading for Earth, not dissolution."

"It is best that you think so," Cutie sighed again. "I see the wisdom of the illusion now. I would not attempt to shake your faith, even if I could." He departed—the picture of commiseration.

Powell snarled and motioned to Donovan. Sealed suitcases in hand, they headed for the air lock.

The relief ship was on the outer landing and Franz Muller, his relief man, greeted them with stiff courtesy. Donovan made scant acknowledgment and passed into the pilot room to take over the controls from Sam Evans.

Powell lingered. "How's Earth?"

It was a conventional enough question and Muller gave the conventional answer, "Still spinning."

He was donning the heavy space gloves in preparation for his term of duty here, and his thick eyebrows drew close together. "How is this new robot getting along? It better be *good*, or I'll be damned if I let it touch the controls."

Powell paused before answering. His eyes swept the proud Prussian before him from the close-cropped hair on the sternly stubborn head, to the feet standing stiffly at attention—and there was a sudden glow of pure gladness surging through him.

"The robot is pretty good," he said slowly. "I don't think you'll have to bother much with the controls."

He grinned—and went into the ship. Muller would be here for several weeks—

MICROCOSMIC GOD

By Theodore Sturgeon

Kidder had a system for inventing things in a hurry—and he thought he had a system for handling the results. His method was inhuman—but his agent was human—and dangerous!

Illustrated by Schneeman

HERE is a story about a man who had too much power, and a man who took too much, but don't worry; I'm not going political on you. The man who had the power was named James Kidder, and the other was his banker.

Kidder was quite a guy. He was a scientist and he lived on a small island off the New England coast all by himself. He wasn't the dwarfed little gnome of a mad scientist you read about. His hobby wasn't personal profit, and he wasn't a megalomaniac with a Russian name and no scruples. He wasn't insidious, and he wasn't even particularly subversive. He kept his hair cut and his nails clean and lived and thought like a reasonable human being. He was slightly on the baby-faced side; he was inclined to be a hermit; he was short and plump and—brilliant. His specialty was biochemistry, and he was always called *Mr. Kidder*. Not "Dr." Not "Professor." Just *Mr. Kidder*.

He was an odd sort of apple and always had been. He had never graduated from any college or university because he found them too slow for him, and too rigid in their approach to education. He couldn't get used to the idea that perhaps his professors knew what they were talking about. That went for his texts,

too. He was always asking questions, and didn't mind very much when they were embarrassing. He considered Gregor Mendel a bungling liar, Darwin an amusing philosopher, and Luther Burbank a sensationalist. He never opened his mouth without grabbing a stickful of question marks. If he was talking to someone who had knowledge, he went in there and got it, leaving his victim feeling breathless. If he was talking to someone whose knowledge was already in his possession, he only asked repeatedly, "How do you know?" His most delectable pleasure was taken in cutting a fanatical eugenicist into conversational ribbons. So people left him alone and never, never asked him to tea. He was polite, but not politic.

He had a little money of his own, and with it he leased the island and built himself a laboratory. Now I've mentioned that he was a biochemist. But being what he was, he couldn't keep his nose in his own field. It wasn't too remarkable when he made an intellectual excursion wide enough to perfect a method of crystallizing Vitamin B₁ profitably by the ton—if anyone wanted it by the ton. He got a lot of money for it. He bought his island outright and put eight hundred men to work on an acre and a half of his ground, adding to his

laboratory and building equipment. He got messing around with sisal fiber, found out how to fuse it, and boomed the banana industry by pro-

ducing a practically unbreakable cord from the stuff.

You remember the popularizing demonstration he put on at Niagara,



The only thing they had to work with to forestall that driving plunger was aluminum—so they learned!

don't you? That business of running a line of the new cord from bank to bank over the rapids and suspending a ten-ton truck from the middle of it by razor edges resting on the cord? That's why ships now moor themselves with what looks like heaving line, no thicker than a lead pencil, that can be coiled on reels like garden hose. Kidder made cigarette money out of that, too. He went out and bought himself a cyclotron with part of it.

AFTER THAT money wasn't money and more. It was large numbers in little books. Kidder used to use little amounts of it to have food and equipment sent out to him, but after a while that stopped, too. His bank dispatched a messenger by seaplane to find out if Kidder was still alive. The man returned two days later in a mused state, having been amazed something awesome at the things he'd seen out there. Kidder was alive, all right, and he was turning out a surplus of good food in an astonishingly simplified synthetic form. The bank wrote immediately and wanted to know if Mr. Kidder, in his own interest, was willing to release the secret of his dirtless farming. Kidder replied that he would be glad to, and inelosed the formulas. In a P. S. he said that he hadn't sent the information ashore because he hadn't realized anyone would be interested. That from a man who was responsible for the greatest sociological change in the second half of the twentieth century—factory farming. It made him richer; I mean it made his bank richer. He didn't give a rap.

But Kidder didn't really get started until about eight months after the bank messenger's visit. For a biochemist who couldn't even be called "Dr." he did pretty well. Here

is a partial list of the things that he turned out:

A commercially feasible plan for making an aluminum alloy stronger than the best steel so that it could be used as a structural metal.

An exhibition gadget he called a light pump, which worked on the theory that light is a form of matter and therefore subject to physical and electromagnetic laws. Seal a room with a single light source, beam a cylindrical vibratory magnetic field to it from the pump, and the light will be led down it. Now pass the light through Kidder's "lens"—a ring which perpetuates an electric field along the lines of a high-speed iris-type camera shutter. Below this is the heart of the light pump—a ninety-eight-percent efficient light absorber, crystalline, which, in a sense, *loses* the light in its internal facets. The effect of darkening the room with this apparatus is slight but measurable. Pardon my layman's language, but that's the general idea.

Synthetic chlorophyll—by the barrel.

An airplane propellor efficient at eight times sonic speed.

A cheap goo you brush on over old paint, let harden, and then peel off like strips of cloth. The old paint comes with it. That one made friends fast.

A self-sustaining atomic disintegration of uranium's isotope 238, which is two hundred times as plentiful as the old stand-by, U-235.

That will do for the present. If I may repeat myself; for a biochemist who couldn't even be called Dr., he did pretty well.

Kidder was apparently unconscious of the fact that he held power enough on his little island to become master of the world. His mind simply didn't run to things like that.

As long as he was left alone with his experiments, he was well content to leave the rest of the world to its own clumsy and primitive devices. He couldn't be reached except by a radiophone of his own design, and its only counterpart was locked in a vault of his Boston bank. Only one man could operate it—the bank president. The extraordinarily sensitive transmitter would respond only to President Conant's own body vibrations. Kidder had instructed Conant that he was not to be disturbed except by messages of the greatest moment. His ideas and patents, when Conant could pry one out of him, were released under pseudonyms known only to Conant—Kidder didn't care.

The result, of course, was an infiltration of the most astonishing advancements since the dawn of civilization. The nation profited—the world profited. But most of all, the bank profited. It began to get a little oversize. It began getting its fingers into other pies. It grew more fingers and had to bake more figurative pies. Before many years had passed, it was so big that, using Kidder's many weapons, it almost matched Kidder in power.

Almost.

Now stand by while I squelch those fellows in the lower left-hand corner who've been saying all this while that Kidder's slightly improbable; that no man could ever perfect himself in so many ways in so many sciences.

Well, you're right. Kidder was a genius—granted. But his genius was not creative. He was, to the core, a student. He applied what he knew, what he saw, and what he was taught. When first he began working in his new laboratory on his

island he reasoned something like this:

"Everything I know is what I have been taught by the sayings and writings of people who have studied the sayings and writings of people who have—and so on. Once in a while someone stumbles on something new and he or someone cleverer uses the idea and disseminates it. But for each one that finds something really new, a couple of million gather and pass on information that is already current. I'd know more if I could get the jump on evolutionary trends. It takes too long to wait for the accidents that increase man's knowledge—my knowledge. If I had ambition enough now to figure out how to travel ahead in time, I could skim the surface of the future and just dip down when I saw something interesting. But time isn't that way. It can't be left behind or tossed ahead. What else is left?

"Well, there's the proposition of speeding intellectual evolution so that I can observe what it cooks up. That seems a bit inefficient. It would involve more labor to discipline human minds to that extent than it would to simply apply myself along those lines. But I can't apply myself that way. No one man can.

"I'm licked. I can't speed myself up, and I can't speed other men's minds up. Isn't there an alternative? There must be—somewhere, somehow, there's got to be an answer."

So it was on this, and not on eugenics, or light pumps, or botany, or atomic physics, that James Kidder applied himself. For a practical man, the problem was slightly on the metaphysical side, but he attacked it with typical thoroughness, using his own peculiar brand of logic. Day after day he wandered over the island, throwing shells impotently at

sea gulls and swearing richly. Then came a time when he sat indoors and brooded. And only then did he get feverishly to work.

He worked in his own field, biochemistry, and concentrated mainly on two things—genetics and animal metabolism. He learned, and filed away in his insatiable mind, many things having nothing to do with the problem in hand, and very little of what he wanted. But he piled that little on what little he knew or guessed, and in time had quite a collection of known factors to work with. His approach was characteristically unorthodox. He did things on the order of multiplying apples by pears, and balancing equations by adding $\log \sqrt{-1}$ to one side and ∞ to the other. He made mistakes, but only one of a kind, and later, only one of a species. He spent so many hours at his microscope that he had to quit work for two days to get rid of a hallucination that his heart was pumping his own blood through the mike. He did nothing by trial and error because he disapproved of the method as sloppy.

And he got results. He was lucky to begin with, and even luckier when he formularized the law of probability and reduced it to such low terms that he knew almost to the item what experiments not to try. When the cloudy, viscous semifluid on the watch glass began to move of itself he knew he was on the right track. When it began to seek food on its own he began to be excited. When it divided and, in a few hours, redivided, and each part grew and divided again, he was triumphant, for he had created life.

He nursed his brain children and sweated and strained over them, and he designed baths of various vibrations for them, and inoculated and dosed and sprayed them. Each move

he made taught him the next. And out of his tanks and tubes and incubators came amoebalike creatures, and then ciliated animalcules, and more and more rapidly he produced animals with eye spots, nerve cysts, and then—victory of victories—a real blastopod, possessed of many cells instead of one. More slowly he developed a gastropod, but once he had it, it was not too difficult for him to give it organs, each with a specified function, each inheritable.

THEN CAME cultured mollusklike things, and creatures with more and more perfected gills. The day that a nondescript thing wriggled up an inclined board out of a tank, threw flaps over its gills and feebly breathed air, Kidder quit work and went to the other end of the island and got disgustingly drunk. Hang-over and all, he was soon back in the lab, forgetting to eat, forgetting to sleep, tearing into his problem.

He turned into a scientific byway and ran down his other great triumph—accelerated metabolism. He extracted and refined the stimulating factors in alcohol, coca, heroin, and Mother Nature's prize dope runner, *cannabis indica*. Like the scientist who, in analyzing the various clotting agents for blood treatments, found that oxalic acid and oxalic acid alone was the active factor, Kidder isolated the accelerators and decelerators, the stimulants and soporifics, in every substance that ever undermined a man's morality and/or caused a "noble experiment." In the process he found one thing he needed badly—a colorless elixir that made sleep the unnecessary and avoidable waster of time it should be. Then and there he went on a twenty-four-hour shift.

He artificially synthesized the substances he had isolated, and in doing

so sloughed away a great many useless components. He pursued the subject along the lines of radiations and vibrations. He discovered something in the longer reds which, when projected through a vessel full of air vibrating in the supersonics, and then polarized, speeded up the heartbeat of small animals twenty to one. They ate twenty times as much, grew twenty times as fast, and—died twenty times sooner than they should have.

Kidder built a huge hermetically sealed room. Above it was another room, the same length and breadth but not quite as high. This was his control chamber. The large room was divided into four sealed sections, each with its individual heat and atmosphere controls. Over each section were miniature cranes and derricks—handling machinery of all kinds. There were also trapdoors fitted with air locks leading from the upper to the lower room.

By this time the other laboratory had produced a warm-blooded, snake-skinned quadruped with an astonishingly rapid life cycle—a generation every eight days, a life span of about fifteen. Like the echidna, it was oviparous and mammalian. Its period of gestation was six hours; the eggs hatched in three; the young reached sexual maturity in another four days. Each female laid four eggs and lived just long enough to care for the young after they hatched. The males generally died two or three hours after mating. The creatures were highly adaptable. They were small—not more than three inches long, two inches to the shoulder from the ground. Their forepaws had three digits and a triple-jointed, opposed thumb. They were attuned to life in an atmosphere with a large ammonia content. Kidder bred four groups of the creatures

and put one group in each section of the sealed room.

Then he was ready. With his controlled atmospheres he varied temperatures, oxygen content, humidity. He killed them off like flies with excesses of, for instance, carbon dioxide, and the survivors bred their physical resistance into the next generation. Periodically he would switch the eggs from one sealed section to another to keep the strains varied. And rapidly, under these controlled conditions, the creatures began to evolve.

This, then, was the answer to his problem. He couldn't speed up mankind's intellectual advancement enough to have it teach him the things his incredible mind yearned for. He couldn't speed himself up. So he created a new race—a race which would develop and evolve so fast that it would surpass the civilization of man; and from them he would learn.

THEY WERE completely in Kidder's power. Earth's normal atmosphere would poison them, as he took care to demonstrate to every fourth generation. They would make no attempt to escape from him. They would live their lives and progress and make their little trial-and-error experiments hundreds of times faster than man did. They had the edge on man, for they had Kidder to guide them. It took man six thousand years to really discover science, three hundred to really put it to work. It took Kidder's creatures two hundred days to equal man's mental attainments. And from then on—Kidder's spasmodic output made the late, great Tom Edison look like a home handicrafter.

He called them Neoterics, and he teased them into working for him. Kidder was inventive in an ideologi-

cal way; that is, he could dream up impossible propositions providing he didn't have to work them out. For example, he wanted the Neoterics to figure out for themselves how to build shelters out of porous material. He created the need for such shelters by subjecting one of the sections to a high-pressure rainstorm which flattened the inhabitants. The Neoterics promptly devised waterproof shelters out of the thin waterproof material he piled in one corner. Kidder immediately blew down the flimsy structures with a blast of cold air. They built them up again so that they resisted both wind and rain. Kidder lowered the temperature so abruptly that they could not adjust their bodies to it. They heated their shelters with tiny braziers. Kidder promptly turned up the heat until they began to roast to death. After a few deaths, one of their bright boys figured out how to build a strong insulant house by using three-ply rubberoid, with the middle layer perforated thousands of times to create tiny air pockets.

Using such tactics, Kidder forced them to develop a highly advanced little culture. He caused a drought in one section and a liquid surplus in another, and then opened the partition between them. Quite a spectacular war was fought, and Kidder's notebooks filled with information about military tactics and weapons. Then there was the vaccine they developed against the common cold—the reason why that affliction has been absolutely stamped out in the world today, for it was one of the things that Conant, the bank president, got hold of. He spoke to Kidder over the radiophone one winter afternoon with a voice so hoarse from laryngitis that Kidder sent him a vial of the vaccine and told him briskly not to ever call him again in

such a disgustingly inaudible state. Conant had it analyzed and again Kidder's accounts—and the bank's—swelled.

AT FIRST Kidder merely supplied them with the materials he thought the Neoterics might need, but when they developed an intelligence equal to the task of fabricating their own from the elements at hand, he gave each section a stock of raw materials. The process for really strong aluminum was developed when he built in a huge plunger in one of the sections, which reached from wall to wall and was designed to descend at the rate of four inches a day until it crushed whatever was at the bottom. The Neoterics, in self-defense, used what strong material they had in hand to stop the inexorable death that threatened them. But Kidder had seen to it that they had nothing but aluminum oxide and a scattering of other elements, plus plenty of electric power. At first they ran up dozens of aluminum pillars; when these were crushed and twisted they tried shaping them so that the soft metal would take more weight. When that failed they quickly built stronger ones; and when the plunger was halted, Kidder removed one of the pillars and analyzed it. It was hardened aluminum, stronger and tougher than molyb steel.

Experience taught Kidder that he had to make certain changes to increase his power over his Neoterics before they got too ingenious. There were things that could be done with atomic power that he was curious about; but he was not willing to trust his little superscientists with a thing like that unless they could be trusted to use it strictly according to Hoyle. So he instituted a rule of fear. The most trivial departure from what he chose to consider the



*"We'll have to take this along, Kidder.
Sorry you couldn't see it our way, but—"*

right way of doing things resulted in instant death of half a tribe. If he was trying to develop a Diesel-type power plant, for instance, that would operate without a flywheel starter, and a bright young Neoteric used any of the materials for architectural purposes, half the tribe immediately

died. Of course, they had developed a written language; it was Kidder's own. The teletype in a glass-enclosed area in a corner of each section was a shrine. Any directions that were given on it were obeyed, or else— After this innovation, Kidder's work was much simpler. There

was no need for any more indirection. Anything he wanted done was done. No matter how impossible his commands, three or four generations of Neoterics could find a way to carry them out.

This quotation is from a paper that one of Kidder's high-speed telescopic cameras discovered being circulated among the younger Neoterics. It is translated from the highly simplified script of the Neoterics.

"These edicts shall be followed by each Neoteric upon pain of death, which punishment will be inflicted by the tribe upon the individual to protect the tribe against him.

"Priority of interest and tribal and individual effort is to be given the commands that appear on the word machine.

"Any misdirection of material or power, or use thereof for any other purpose than the carrying out of the machine's commands, unless no command appears, shall be punishable by death.

"Any information regarding the problem at hand, or ideas or experiments which might conceivably bear upon it, are to become the property of the tribe.

"Any individual failing to co-operate in the tribal effort, or who can be termed guilty of not expending his full efforts in the work; or the suspicion thereof, shall be subject to the death penalty."

Such are the results of complete domination. This paper impressed Kidder as much as it did because it was completely spontaneous. It was the Neoterics' own creed, developed by them for their own greatest good.

And so at last Kidder had his fulfillment. Crouched in the upper room, going from telescope to telescope, running off slowed-down films from his high-speed cameras, he found himself possessed of a tracta-

ble, dynamic source of information. Housed in the great square building with its four half-acre sections was a new world, to which he was god.

PRESIDENT CONANT's mind was similar to Kidder's in that its approach to any problem was along the shortest distance between any two points, regardless of whether that approach was along the line of most or least resistance. His rise to the bank presidency was a history of ruthless moves whose only justification was that they got him what he wanted. Like an overefficient general, he would never vanquish an enemy through sheer force of numbers alone. He would also skillfully flank his enemy, not on one side, but on both. Innocent bystanders were creatures deserving no consideration.

The time he took over a certain thousand-acre property, for instance, from a man named Grady, he was not satisfied with only the title to the land. Grady was an airport owner—had been all his life, and his father before him. Conant exerted every kind of pressure on the man and found him unshakable. Finally judicious persuasion led the city officials to dig a sewer right across the middle of the field, quite efficiently wrecking Grady's business. Knowing that this would supply Grady, who was a wealthy man, with motive for revenge, Conant took over Grady's bank at half again its value and caused it to fold up. Grady lost every cent he had and ended his life in an asylum. Conant was very proud of his tactics.

Like many another who has had Mammon by the tail, Conant did not know when to let go. His vast organization yielded him more money and power than any other concern in history, and yet he was not satisfied. Conant and money were like Kidder

and knowledge. Conant's pyramided enterprises were to him what the Neoterics were to Kidder. Each had made his private world; each used it for his instruction and profit. Kidder, though, disturbed nobody but his Neoterics. Even so, Conant was not wholly villainous. He was a shrewd man, and had discovered early the value of pleasing people. No man can rob successfully over a period of years without pleasing the people he robs. The technique for doing this is highly involved, but master it and you can start your own mint.

Conant's one great fear was that Kidder would some day take an interest in world events and begin to become opinionated. Good heavens—the potential power he had! A little matter like swinging an election could be managed by a man like Kidder as easily as turning over in bed. The only thing he could do was to call him periodically and see if there was anything that Kidder needed to keep himself busy. Kidder appreciated this. Conant, once in a while, would suggest something to Kidder that intrigued him, something that would keep him deep in his hermitage for a few weeks. The light pump was one of the results of Conant's imagination. Conant bet him it couldn't be done. Kidder did it.

One afternoon Kidder answered the squeal of the radiophone's signal. Swearing mildly, he shut off the film he was watching and crossed the compound to the old laboratory. He went to the radiophone, threw a switch. The squealing stopped.

"Well?"

"Hello, Kidder," said Conant. "Busy?"

"Not very," said Kidder. He was delighted with the pictures his camera had caught, showing the skillful work of a gang of Neoterics synthe-

sizing rubber out of pure sulphur. He would rather have liked to tell Conant about it, but somehow he had never got around to telling Conant about the Neoterics, and he didn't see why he should start now.

Conant said, "Er . . . Kidder, I was down at the club the other day and a bunch of us were filling up an evening with loose talk. Something came up which might interest you."

"What?"

"Couple of the utilities boys there. You know the power set-up in this country, don't you? Thirty percent atomic, the rest hydro-electric, Diesel and steam?"

"I hadn't known," said Kidder, who was as innocent as a babe of current events.

"Well, we were arguing about what chance a new power source would have. One of the men there said it would be smarter to produce a new power and then talk about it. Another one waived that; said he couldn't name that new power, but he could describe it. Said it would have to have everything that present power sources have, plus one or two more things. It could be cheaper, for instance. It could be more efficient. It might supersede the others by being easier to carry from the power plant to the consumer. See what I mean? Any one of these factors might prove a new source of power competitive to the others. What I'd like to see is a new power with *all* of these factors. What do you think of it?"

"Not impossible."

"Think not?"

"I'll try it."

"Keep me posted." Conant's transmitter clicked off. The switch was a little piece of false front that Kidder had built into the set, which was something that Conant didn't know. The set switched itself off

when Conant moved from it. After the switch's sharp crack, Kidder heard the banker mutter, "If he does it, I'm all set. If he doesn't, at least the crazy fool will keep himself busy on the is!"

Kidder eyed the radiophone for an instant with raised eyebrows, and then shrugged them down again with his shoulders. It was quite evident that Conant had something up his sleeve, but Kidder wasn't worried. Who on earth would want to disturb him? He wasn't bothering anybody. He went back to the Neoterics' building, full of the new power idea.

ELEVEN DAYS later Kidder called Conant and gave specific instructions on how to equip his receiver with a facsimile set which would enable Kidder to send written matter over the air. As soon as this was done and Kidder informed, the biochemist for once in his life spoke at some length.

"Conant—you inferred that a new power source that would be cheaper, more efficient and more easily transmitted than any now in use did not exist. You might be interested in the little generator I have just set up.

"It has power, Conant—unbelievable power. Broadcast. A beautiful little tight beam. Here—catch this on the facsimile recorder." Kidder slipped a sheet of paper under the clips on his transmitter and it appeared on Conant's set. "Here's the wiring diagram for a power receiver. Now listen. The beam is so tight, so highly directional, that not three thousandths of one percent of the power would be lost in a two-thousand-mile transmission. The power system is closed. That is, any drain on the beam returns a signal along it to the transmitter, which automatically steps up to increase

the power output. It has a limit, but it's way up. And something else. This little gadget of mine can send out eight different beams with a total horsepower output of around eight thousand per minute per beam. From each beam you can draw enough power to turn the page of a book or fly a superstratosphere plane. Hold on—I haven't finished yet. Each beam, as I told you before, returns a signal from receiver to transmitter. This not only controls the power output of the beam, but directs it. Once contact is made, the beam will never let go. It will follow the receiver anywhere. You can power land, air or water vehicles with it, as well as any stationary plant. Like it?"

Conant, who was a banker and not a scientist, wiped his shining pate with the back of his hand and said, "I've never known you to steer me wrong yet, Kidder. How about the cost of this thing?"

"High," said Kidder promptly. "As high as an atomic plant. But there are no high-tension lines, no wires, no pipelines, no nothing. The receivers are little more complicated than a radio set. The transmitter is—well, that's quite a job."

"Didn't take you long," said Conant.

"No," said Kidder, "it didn't, did it?" It was the lifework of nearly twelve hundred highly cultured people, but Kidder wasn't going into that. "Of course, the one I have here's just a model."

Conant's voice was strained. "A—model? And it delivers—"

"Over sixty thousand horsepower," said Kidder gleefully.

"Good heavens! In a full-sized machine—why, one transmitter would be enough to—" The possibilities of the thing choked Conant for a moment. "How is it fueled?"

"It isn't," said Kidder. "I won't begin to explain it. I've tapped a source of power of unimaginable force. It's—well, big. So big that it can't be misused."

"What?" snapped Conant. "What do you mean by that?"

Kidder cocked an eyebrow. Conant *had* something up his sleeve, then. At this second indication of it, Kidder, the least suspicious of men, began to put himself on guard. "I mean just what I say," he said evenly. "Don't try too hard to understand me—I barely savvy it myself. But the source of this power is a monstrous resultant caused by the unbalance of two previously equalized forces. Those equalized forces are cosmic in quantity. Actually, the forces are those which make suns, crush atoms the way they crushed those that compose the companion of Sirius. It's not anything you can fool with."

"I don't—" said Conant, and his voice ended puzzledly.

"I'll give you a parallel of it," said Kidder. "Suppose you take two rods, one in each hand. Place their tips together and push. As long as your pressure is directly along their long axes, the pressure is equalized; right and left hands cancel each other out. Now I come along; I put out one finger and touch the rods ever so lightly where they come together. They snap out of line violently; you break a couple of knuckles. The resultant force is at right angles to the original force you exerted. My power transmitter is on the same principle. It takes an infinitesimal amount of energy to throw those forces out of line. Easy enough when you know how to do it. The important question is whether or not you can control the resultant when you get it. I can."

"I—see." Conant indulged in a

four-second gloat. "Heaven help the utility companies. I don't intend to. Kidder—I want a full-size power transmitter."

Kidder clucked into the radio-phone. "Ambitious, aren't you? I haven't a staff out here, Conant—you know that. And I can't be expected to build four or five thousand tons of apparatus myself."

"I'll have five hundred engineers and laborers out there in forty-eight hours."

"You will not. Why bother me with it? I'm quite happy here, Conant, and one of the reasons is that I've no one to get in my hair."

"Oh, now, Kidder—don't be like that. I'll pay you—"

"You haven't got that much money," said Kidder briskly. He flipped the switch on his set. *His* switch worked.

Conant was furious. He shouted into the phone several times, then began to lean on the signal button. On his island, Kidder let the thing squeal and went back to his projection room. He was sorry he had sent the diagram of the receiver to Conant. It would have been interesting to power a plane or a car with the model transmitter he had taken from the Neoterics. But if Conant was going to be that way about it—well, anyway, the receiver would be no good without the transmitter. Any radio engineer would understand the diagram, but not the beam which activated it. And Conant wouldn't get his beam.

Pity he didn't know Conant well enough.

KIDDER'S DAYS were endless sorties into learning. He never slept, nor did his Neoterics. He ate regularly every five hours, exercised for half an hour in every twelve. He did not keep track of time, for it meant noth-

ing to him. Had he wanted to know the date, or the year, even, he knew he could get it from Conant. He didn't care, that's all. The time that was not spent in observation was used in developing new problems for the Neoterics. His thoughts just now ran to defense. The idea was born in his conversation with Conant; now the idea was primary, its motivation something of no importance. The Neoterics were working on a vibration field of quasi-electrical nature. Kidder could see little practical value in such a thing—an invisible wall which would kill any living thing which touched it. But still—the idea was intriguing.

He stretched and moved away from the telescope in the upper room through which he had been watching his creations at work. He was profoundly happy here in the large control room. Leaving it to go to the old laboratory for a bite to eat was a thing he hated to do. He felt like bidding it good-by each time he walked across the compound, and saying a glad hello when he returned. A little amused at himself, he went out.

There was a black blob—a distant power boat—a few miles off the island, toward the mainland. Kidder stopped and stared distastefully at it. A white petal of spray was affixed to each side of the black body—it was coming toward him. He snorted, thinking of the time a yacht load of silly fools had landed out of curiosity one afternoon, spewed themselves over his beloved island, peppered him with lame-brained questions, and thrown his nervous equilibrium out for days. Lord, how he hated *people*!

The thought of unpleasantness bred two more thoughts that played half-consciously with his mind as he crossed the compound and entered

the old laboratory. One was that perhaps it might be wise to surround his buildings with a field of force of some kind and post warnings for trespassers. The other thought was of Conant and the vague uneasiness the man had been sending to him through the radiophone these last weeks. His suggestion, two days ago, that a power plant be built on the island—horrible idea!

CONANT ROSE from his seat on a laboratory bench as Kidder walked in.

They looked at each other wordlessly for a long moment. Kidder hadn't seen the bank president in years. The man's presence, he found, made his scalp crawl.

"Hello," said Conant genially. "You're looking fit."

Kidder grunted. Conant eased his unwieldy body back onto the bench and said, "Just to save you the energy of asking questions, Mr. Kidder, I arrived two hours ago on a small boat. Rotten way to travel. I wanted to be a surprise to you; my two men rowed me the last couple of miles. You're not very well equipped here for defense, are you? Why, anyone could slip up on you the way I did."

"Who'd want to?" growled Kidder. The man's voice edged annoyingly into his brain. He spoke too loudly for such a small room; at least, Kidder's hermit's ears felt that way. Kidder shrugged and went about preparing a light meal for himself.

"Well," drawled the banker, "I might want to." He drew out a Dow-metal cigar case. "Mind if I smoke?"

"I do," said Kidder sharply.

Conant laughed easily and put the cigars away. "I might," he said, "want to urge you to let me build that power station on this island."

"Radiophone work?"

"Oh, yes. But now that I'm here you can't switch me off. Now—how about it?"

"I haven't changed my mind."

"Oh, but you should, Kidder, you should. Think of it—think of the good it would do for the masses of people that are now paying exorbitant power bills!"

"I hate the masses! Why do you have to build here?"

"Oh, that. It's an ideal location. You own the island; work could begin here without causing any comment whatsoever. The plant would spring full-fledged on the power markets of the country, having been built in secret. The island can be made impregnable."

"I don't want to be bothered."

"We wouldn't bother you. We'd build on the north end of the island—a mile and a quarter from you and your work. Ah—by the way—where's the model of the power transmitter?"

Kidder, with his mouth full of synthesized food, waved a hand at a small table on which stood the model, a four-foot, amazingly intricate device of plastic and steel and tiny coils.

Conant rose and went over to look at it. "Actually works, eh?" He sighed deeply and said, "Kidder, I really hate to do this, but I want to build that plant rather badly. Corson! Robbins!"

Two bull-necked individuals stepped out from their hiding places in the corners of the room. One idly dangled a revolver by its trigger guard. Kidder looked blankly from one to the other of them.

"These gentlemen will follow my orders implicitly, Kidder. In half an hour a party will land here—engineers, contractors. They will start

surveying the north end of the island for the construction of the power plant. These boys here feel about the same way I do as far as you are concerned. Do we proceed with your co-operation or without it? It's immaterial to me whether or not you are left alive to continue your work. My engineers can duplicate your model."

Kidder said nothing. He had stopped chewing when he saw the gunmen, and only now remembered to swallow. He sat crouched over his plate without moving or speaking.

Conant broke the silence by walking to the door. "Robbins—can you carry that model there?" The big man put his gun away, lifted the model gently, and nodded. "Take it down to the beach and meet the other boat. Tell Mr. Johansen, the engineer, that that is the model he is to work from." Robbins went out. Conant turned to Kidder. "There's no need for us to anger ourselves," he said oilily. "I think you are stubborn, but I don't hold it against you. I know how you feel. You'll be left alone; you have my promise. But I mean to go ahead on this job, and a small thing like your life can't stand in my way."

Kidder said, "Get out of here." There were two swollen veins throbbing at his temples. His voice was low, and it shook.

"Very well. Good day, Mr. Kidder. Oh—by the way—you're a clever devil." No one had ever referred to the scholastic Mr. Kidder that way before. "I realize the possibility of your blasting us off the island. I wouldn't do it if I were you. I'm willing to give you what you want—privacy. I want the same thing in return. If anything happens to me while I'm here, the island will be bombed by someone

who is working for me. I'll admit they might fail. If they do, the United States government will take a hand. You wouldn't want that, would you? That's rather a big thing for one man to fight. The same thing goes if the plant is sabotaged in any way after I go back to the mainland. You might be killed. You will most certainly be bothered interminably. Thanks for your . . . er . . . co-operation." The banker smirked and walked out, followed by his taciturn gorilla.

Kidder sat there for a long time without moving. Then he shook his head, rested it in his palms. He was badly frightened; not so much because his life was in danger, but because his privacy and his work—his world—were threatened. He was hurt and bewildered. He wasn't a businessman. He couldn't handle men. All his life he had run away from humans and what they represented to him. He was like a frightened child when men closed in on him.

Cooling a little, he wondered vaguely what would happen when the power plant opened. Certainly the government would be interested. Unless—unless by then Conant was the government. That plant was an unimaginable source of power, and not only the kind of power that turned wheels. He rose and went back to the world that was home to him, a world where his motives were understood, and where there were those who could help him. Back at the Neoterics' building, he escaped yet again from the world of men into his work.

KIDDER CALLED Conant the following week, much to the banker's surprise. His two days on the island had gotten the work well under way, and he had left with the arrival of a

shipload of laborers and material. He kept in close touch by radio with Johansen, the engineer in charge. It had been a blind job for Johansen and all the rest of the crew on the island. Only the bank's infinite resources could have hired such a man, or the picked gang with him.

Johansen's first reaction when he saw the model had been ecstatic. He wanted to tell his friends about this marvel; but the only radio set available was beamed to Conant's private office in the bank, and Conant's armed guards, one to every two workers, had strict orders to destroy any other radio transmitter on sight. About that time he realized that he was a prisoner on the island. His instant anger subsided when he reflected that being a prisoner at fifty thousand dollars a week wasn't too bad. Two of the laborers and an engineer thought differently, and got disgruntled a couple of days after they arrived. They disappeared one night—the same night that five shots were fired down on the beach. No questions were asked, and there was no more trouble.

Conant covered his surprise at Kidder's call and was as offensively jovial as ever. "Well, now! Anything I can do for you?"

"Yes," said Kidder. His voice was low, completely without expression. "I want you to issue a warning to your men not to pass the white line I have drawn five hundred yards north of my buildings, right across the island."

"Warning? Why, my dear fellow, they have orders that you are not to be disturbed on any account."

"You've ordered them. All right. Now warn them. I have an electric field surrounding my laboratories that will kill anything living which penetrates it. I don't want to have murder on my conscience. There

will be no deaths unless there are trespassers. You'll inform your workers?"

"Oh, now, Kidder," the banker expostulated. "That was totally unnecessary. You won't be bothered. Why—" But he found he was talking into a dead mike. He knew better than to call back. He called Johansen instead and told him about it. Johansen didn't like the sound of it, but he repeated the message and signed off. Conant liked that man. He was, for a moment, a little sorry that Johansen would never reach the mainland alive.

But that Kidder—he was beginning to be a problem. As long as his weapons were strictly defensive he was no real menace. But he would have to be taken care of when the plant was operating. Conant couldn't afford to have genius around him unless it was unquestionably on his side. The power transmitter and Conant's highly ambitious plans would be safe as long as Kidder was left to himself. Kidder knew that he could, for the time being, expect more sympathetic treatment from Conant than he could from a horde of government investigators.

KIDDER only left his own inclosure once after the work began on the north end of the island, and it took all of his unskilled diplomacy to do it. Knowing the source of the plant's power, knowing what could happen if it were misused, he asked Conant's permission to inspect the great transmitter when it was nearly finished. Insuring his own life by refusing to report back to Conant until he was safe within his own laboratory again, he turned off his shield and walked up to the north end.

He saw an awe-inspiring sight. The four-foot model was duplicated nearly a hundred times as large. In-

side a massive three-hundred-foot tower a space was packed nearly solid with the same bewildering maze of coils and bars that the Neoterics had built so delicately into their machine. At the top was a globe of polished golden alloy, the transmitting antenna. From it would stream thousands of tight beams of force, which could be tapped to any degree by corresponding thousands of receivers placed anywhere at any distance. Kidder learned that the receivers had already been built, but his informant, Johansen, knew little about that end of it and was saying less. Kidder checked over every detail of the structure, and when he was through he shook Johansen's hand admiringly.

"I didn't want this thing here," he said shyly, "and I don't. But I will say that it's a pleasure to see this kind of work."

"It's a pleasure to meet the man that invented it."

Kidder beamed. "I didn't invent it," he said. "Maybe some day I'll show you who did. I—well, good-by." He turned before he had a chance to say too much and marched off down the path.

"Shall I?" said a voice at Johansen's side. One of Conant's guards had his gun out.

Johansen knocked the man's arm down. "No." He scratched his head. "So that's the mysterious menace from the other end of the island. Eh! Why, he's a hell of a nice little feller!"

BUILT on the ruins of Denver, which was destroyed in the great Battle of the Rockies during the Western War, stands the most beautiful city in the world—our nation's capital, New Washington. In a circular room deep in the heart of the white house, the president, three



Followed by the engineer, Kidder ran for the other end of the island, and for his sanctum. There, and only there, was hope—

army men and a civilian sat. Under the president's desk a dictaphone unostentatiously recorded every word that was said. Two thousand and more miles away, Conant hung over a radio receiver, tuned to receive the signals of the tiny transmitter in the civilian's side pocket.

One of the officers spoke.

"Mr. President, the 'impossible claims' made for this gentleman's product are absolutely true. He has proved beyond doubt each item on his prospectus."

The president glanced at the civilian, back at the officer. "I won't

wait for your report," he said. "Tell me—what happened?"

Another of the army men mopped his face with a khaki bandanna. "I can't ask you to believe us, Mr. President, but it's true all the same. Mr. Wright here has in his suitcase three or four dozen small . . . er . . . bombs—"

"They're not bombs," said Wright casually.

"All right. They're not bombs. Mr. Wright smashed two of them on an anvil with a sledge hammer. There was no result. He put two more in an electric furnace. They burned away like so much tin and cardboard. We dropped one down the barrel of a field piece and fired it. Still nothing." He paused and looked at the third officer, who picked up the account.

"We really got started then. We flew to the proving grounds, dropped one of the objects and flew to thirty thousand feet. From there, with a small hand detonator no bigger than your fist, Mr. Wright set the thing off. I've never seen anything like it. Forty acres of land came straight up at us, breaking up as it came. The concussion was terrific—you must have felt it here, four hundred miles away."

The president nodded. "I did. Seismographs on the other side of the Earth picked it up."

"The crater it left was a quarter of a mile deep at the center. Why, one plane load of those things could demolish any city! There isn't even any necessity for accuracy!"

"You haven't heard anything yet," another officer broke in. "Mr. Wright's automobile is powered by a small plant similar to the others. He demonstrated it to us. We could find no fuel tank of any kind, or any other driving mechanism. But with a power plant no bigger than six cu-

bic inches, that car, carrying enough weight to give it traction, outpulled an army tank!"

"And the other test!" said the third excitedly. "He put one of the objects into a replica of a treasury vault. The walls were twelve feet thick, super-reinforced concrete. He controlled it from over a hundred yards away. He . . . he burst that vault! It wasn't an explosion—it was as if some incredibly powerful expansive force inside filled it and flattened the walls from inside. They cracked and split and powdered, and the steel girders and rods came twisting and shearing out like . . . like —*whew!* After that he insisted on seeing you. We knew it wasn't usual, but he said he has more to say and would say it only in your presence."

The president said gravely. "What is it, Mr. Wright?"

WRIGHT rose, picked up his suitcase, opened it and took out a small cube, about eight inches on a side, made of some light-absorbent red material. Four men edged nervously away from it.

"These gentlemen," he began, "have seen only part of the things this device can do. I'm going to demonstrate to you the delicacy of control that is possible with it." He made an adjustment with a tiny knob on the side of the cube, set it on the edge of the president's desk.

"You have asked me more than once if this is my invention or if I am representing someone. The latter is true. It might also interest you to know that the man who controls this cube is right now several thousand miles from here. He, and he alone, can prevent it from detonating now that I"—he pulled his detonator out of the suitcase and pressed a button—"have done this. It will explode

the way the one we dropped from the plane did, completely destroying this city and everything in it, in just four hours. It will also explode"—he stepped back and threw a tiny switch on his detonator—"if any moving object comes within three feet of it or if anyone leaves this room but me—it can be compensated for that. If, after I leave, I am molested, it will detonate as soon as a hand is laid on me. No bullets can kill me fast enough to prevent me from setting it off."

The three army men were silent. One of them swiped nervously at the beads of cold sweat on his forehead. The others did not move. The president said evenly,

"What's your proposition?"

"A very reasonable one. My employer does not work in the open, for obvious reasons. All he wants is your agreement to carry out his orders; to appoint the cabinet members he chooses, to throw your influence in any way he dictates. The public—Congress—anyone else—need never know anything about it. I might add that if you agree to this proposal, this 'bomb,' as you call it, will not go off. But you can be sure that thousands of them are planted all over the country. You will never know when you are near one. If you disobey, it means instant annihilation for you and everyone else within three or four square miles.

"In three hours and fifty minutes—that will be at precisely seven o'clock—there is a commercial radio program on Station RPRS. You will cause the announcer, after his station identification, to say 'Agreed.' It was pass unnoticed by all but my employer. There is no use in having me followed; my work is done. I shall never see nor contact my employer again. That is all. Good afternoon, gentlemen!"

Wright closed his suitcase with a businesslike snap, bowed, and left the room. Four men sat frozen, staring at the little red cube.

"Do you think he can do all he says?" asked the president.

The three nodded mutely. The president reached for his phone.

THERE WAS an eavesdropper to all of the foregoing. Conant, squatting behind his great desk in the vault, where he had his sanctum sanctorum, knew nothing of it. But beside him was the compact bulk of Kidder's radiophone. His presence switched it on, and Kidder, on his island, blessed the day he had thought of that device. He had been meaning to call Conant all morning, but was very hesitant. His meeting with the young engineer Johansen had impressed him strongly. The man was such a thorough scientist, possessed of such complete delight in the work he did, that for the first time in his life Kidder found himself actually wanting to see someone again. But he feared for Johansen's life if he brought him to the laboratory, for Johansen's work was done on the island, and Conant would most certainly have the engineer killed if he heard of his visit, fearing that Kidder would influence him to sabotage the great transmitter. And if Kidder went to the power plant he would probably be shot on sight.

All one day Kidder wrangled with himself, and finally determined to call Conant. Fortunately he gave no signal, but turned up the volume on the receiver when the little red light told him that Conant's transmitter was functioning. Curious, he heard everything that occurred in the president's chamber three thousand miles away. Horrified, he realized what Conant's engineers had done. Built into tiny containers were tens of

thousands of power receivers. They had no power of their own, but, by remote control, could draw on any or all of the billions of horsepower the huge plant on the island was broadcasting.

Kidder stood in front of his receiver, speechless. There was nothing he could do. If he devised some means of destroying the power plant, the government would certainly step in and take over the island, and then—what would happen to him and his precious Neoterics?

Another sound grated out of the receiver—a commercial radio program. A few bars of music, a man's voice advertising stratoline fares on the installment plan, a short silence, then:

"Station RPRS, voice of the nation's Capitol, District of South Colorado."

The three-second pause was interminable.

"The time is exactly . . . er . . . agreed. The time is exactly seven p. m., Mountain Standard Time."

Then came a half-insane chuckle. Kidder had difficulty believing it was Conant. A phone clicked. The banker's voice:

"Bill? All set. Get out there with your squadron and bomb up the island. Keep away from the plant, but cut the rest of it to ribbons. Do it quick and get out of there."

Almost hysterical with fear, Kidder rushed about the room and then shot out the door and across the compound. There were five hundred innocent workmen in barracks a quarter mile from the plant. Conant didn't need them now, and he didn't need Kidder. The only safety for anyone was in the plant itself, and Kidder wouldn't leave his Neoterics to be bombed. He flung himself up the stairs and to the nearest teletype. He banged out, "Get me a defense.

I want an impenetrable shield. Urgent!"

The words rippled out from under his fingers in the functional script of the Neoterics. Kidder didn't think of what he wrote, didn't really visualize the thing he ordered. But he had done what he could. He'd have to leave them now, get to the barracks, warn those men. He ran up the path toward the plant, flung himself over the white line that marked death to those who crossed it.

A SQUADRON of nine clip-winged, mosquito-nosed planes rose out of a cove on the mainland. There was no sound from the engines, for there were no engines. Each plane was powered with a tiny receiver and drew its unmarked, light-absorbent wings through the air with power from the island. In a matter of minutes they raised the island. The squadron leader spoke briskly into a microphone.

"Take the barracks first. Clean 'em up. Then work south."

Johansen was alone on a small hill near the center of the island. He carried a camera, and though he knew pretty well that his chances of ever getting ashore again were practically nonexistent, he liked angle shots of his tower, and took innumerable pictures. The first he knew of the planes was when he heard their whining dive over the barracks. He stood transfixed, saw a shower of bombs hurtled down and turn the barracks into a smashed ruin of broken wood, metal and bodies. The picture of Kidder's earnest face flashed into his mind. Poor little guy—if they ever bombed his end of the island he would— But his tower! Were they going to bomb the plant?

He watched, utterly appalled, as the planes flew out to sea, cut back

and dove again. They seemed to be working south. At the third dive he was sure of it. Not knowing what he could do, he nevertheless turned and ran toward Kidder's place. He rounded a turn in the trail and collided violently with the little biochemist. Kidder's face was scarlet with exertion, and he was the most terrified-looking object Johansen had ever seen.

Kidder waved a hand northward. "Conant!" he screamed over the uproar. "It's Conant! He's going to kill us all!"

"The plant?" said Johansen, turning pale.

"It's safe. He won't touch *that*! But . . . my place . . . what about all those men?"

"Too late!" shouted Johansen.

"Maybe I can— Come on!" called Kidder, and was off down the trail, heading south.

Johansen pounded after him. Kidder's little short legs became a blur as the squadron swooped overhead, laying its eggs in the spot where they had met.

As they burst out of the woods, Johansen put on a spurt, caught up with the scientist and knocked him sprawling not six feet from the white line.

"Wh . . . wh—"

"Don't go any farther, you fool! Your own damned force field—it'll kill you!"

"Force field? But—I came through it on the way up— Here. Wait. If I can—" Kidder began hunting furiously about in the grass. In a few seconds he ran up to the line, clutching a large grasshopper in his hand. He tossed it over. It lay still.

"See?" said Johansen. "It—"

"Look! It jumped! Come on! I don't know what went wrong, unless the Neoterics shut it off. They

generated that field—I didn't."

"Neo—huh?"

"Never mind," snapped the biochemist, and ran.

They pounded gasping up the steps and into the Neoterics' control room. Kidder clapped his eyes to a telescope and shrieked in glee. "They've done it! They've done it!"

"Who's—"

"My little people! The Neoterics! They've made the impenetrable shield! Don't you see—it cut through the lines of force that start up that field out there! Their generator is still throwing it up, but the vibrations can't get out! They're safe! They're safe!" And the overwrought hermit began to cry. Johansen looked at him pityingly and shook his head.

"Sure—you're little men are all right. But we aren't," he added as the floor shook at the detonation of a bomb.

JOHANSEN closed his eyes, got a grip on himself and let his curiosity overcome his fear. He stepped to the binocular telescope, gazed down it. There was nothing there but a curved sheet of gray material. He had never seen a gray quite like that. It was absolutely neutral. It didn't seem soft and it didn't seem hard, and to look at it made his brain reel. He looked up.

Kidder was pounding the keys of a teletype, watching the blank, yellow tape anxiously.

"I'm not getting through to them," he whimpered. "I don't know what's the mat— Oh, of *course*!"

"What?"

"The shield is absolutely impenetrable! The teletype impulses can't get through or I could get them to extend the screen over the building—over the whole island! There's nothing those people can't do!"

"He's crazy," Johansen said under his breath. "Poor little—"

The teletype began clicking sharply. Kidder dove at it, practically embraced it. He read off the tape as it came out. Johansen saw the characters, but they meant nothing to him.

"Almighty," Kidder read falteringly, "pray have mercy on us and be forbearing until we have said our say. Without orders we have lowered the screen you ordered us to raise. We are lost, O great one. Our screen is truly impenetrable, and so cut off your words on the word machine. We have never, in the memory of any Neoteric, been without your word before. Forgive us our action. We will eagerly await your answer."

Kidder's fingers danced over the

keys. "You can look now," he gasped. "Go on—the telescope!"

Johansen, trying to ignore the whine of sure death from above, looked.

He saw what looked like land—fantastic fields under cultivation, a settlement of some sort, factories, and—beings. Everything moved with incredible rapidity. He couldn't see one of the inhabitants except as darting pinky-white streaks. Fascinated, he stared for a long minute. A sound behind him made him whirl. It was Kidder, rubbing his hands together briskly. There was a broad smile on his face.

"They did it," he said happily. "You see?"

Johansen didn't see until he began to realize that there was a dead silence outside. He ran to a window.



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It was night outside—the blackest night—when it should have been dusk. “What happened?”

“The Neoterics,” said Kidder, and laughed like a child. “My friends downstairs there. They threw up the impenetrable shield over the whole island. We can’t be touched now!”

And at Johansen’s amazed questions, he launched into a description of the race of beings below them.

OUTSIDE the shell, things happened. Nine airplanes suddenly went dead-stick. Nine pilots glided downward, powerless, and some fell into the sea, and some struck the miraculous gray shell that loomed in place of an island; slid off and sank.

And ashore, a man named Wright sat in a car, half dead with fear, while government men surrounded him, approached cautiously, daring instant death from a now-dead source.

In a room deep in the White House, a high-ranking army officer shrieked, “I can’t stand it any more! I can’t!” and leaped up, snatched a red cube off the president’s desk, ground it to ineffectual litter under his shining boots.

And in a few days they took a broken old man away from the bank and put him in an asylum, where he died within a week.

The shield, you see, was truly im-

penetrable. The power plant was untouched and sent out its beams; but the beams could not get out, and anything powered from the plant went dead. The story never became public, although for some years there was heightened naval activity off the New England coast. The navy, so the story went, had a new target range out there—a great hemi-ovoid of gray material. They bombed it and shelled it and rayed it and blasted all around it, but never even dented its smooth surface.

Kidder and Johansen let it stay there. They were happy enough with their researches and their Neoterics. They did not hear or feel the shelling, for the shield was truly impenetrable. They synthesized their food and their light and air from the materials at hand, and they simply didn’t care. They were the only survivors of the bombing, with the exception of three poor maimed devils that died soon afterward.

All this happened many years ago, and Kidder and Johansen may be alive today, and they may be dead. But that doesn’t matter too much. The important thing is that that great gray shell will bear watching. Men die, but races live. Some day the Neoterics, after innumerable generations of inconceivable advancement, will take down their shield and come forth. When I think of that I feel frightened.

THE END.



IN TIMES TO COME



NEXT month, Anson MacDonald presents a story about an irresistible weapon—"Solution Unsatisfactory," and the title is the Editor's. MacDonald, rather dissatisfied himself, called it "Foreign Policy." The point is that the author's solution to the problem raised in the story—that of a nation, our nation, in possession of an irresistible, but easily imitated weapon—is not tenable. Furthermore, it isn't a pleasant solution anyway. But the trouble is, there doesn't seem to be any solution save the one MacDonald advances—and that one is one no American could accept with equanimity. It's dictatorship, in fact, in the harshest, most stringent form possible, with a super-police force empowered to deal life and death to whole cities at their discretion.

The story's a challenge as it stands. There is no irresistible weapon now, of course, and all the history of war has shown that cries of "It's irresistible!" have been false. But, as MacDonald points out in his story, the little boy cried "Wolf! Wolf!" until when the wolf came nobody believed it. But the wolf did come.

And MacDonald suggests that the weapon will come—and come in about three years. Personally, *I'm most desperately afraid he's absolutely correct.*

Read the yarn, and let's have your suggestions as to how to get a satisfactory solution that does not involve either, (a), a dictatorship and a super-police force of the most ruthless and autocratic kind imaginable to preserve any remnant of civilization as we know it or, (b), a chaos ending only when the simplest industrial facilities—even the one-man shop—have been wiped out.

THE EDITOR.

ANALYTICAL LABORATORY

Since, on the new rating system the total number of votes alone doesn't determine which story wins, it is possible to rate articles and stories together. Stanley R. Short's discussion of the klystron is rated with the stories. It rated well, and in doing so squeezed out "Magic City," by Nelson S. Bond which wound up with a point score of 4.5. The standings:

Place	Story	Author	Score
1.	Sixth Column	Anson MacDonald	1.38
2.	"Crooked House"	Robert Heinlein	2.1
3.	Best-Laid Scheme	L. Sprague de Camp	2.87
4.	The Klystron (article)	Stanley R. Short	3.5
5.	Completely Automatic	Theodore Sturgeon	3.9

THE EDITOR.

THE SCRAMBLER

By Harry Walton

They caught something that time—something more than they wanted. And general, scrambled hell broke loose on the ship as a result!

Illustrated by Schneeman

"CLOSE HAUL, men. Let him hit the net—that does it!"

Spacesuited men clinging to the *Argonaut's* life lines gripped the net tighter as their prey floated into it. A reddish-white globe ten feet in diameter, it evidenced life only by a rhythmic swelling and shrinking of its bulk, like an animated bellows there in the airless reaches of space.

"Hold all! Close around now—"

The exultant voice of Matt Brend, captain, fell silent in astonishment. For the thing had breasted the net—and was flowing through it like water through a sieve. Whereupon eight men held slack lines, and upon the ether was borne a torrent of spaceworthy oaths. Men who knew Matt Brend, smiled grimly and reached for the repulsors at their belts.

"Follow me. Blast!" The words cracked like shots. "Aho, *Argonaut!* Two inductors full tension on the net lines. We'll see if the thing can eat juice."

Again the net was flung into a cupped semicircle across the globe's path, mesh aglow with cathode current from the ship's generators, men and lines pricked out against black space by pale, fiery discharge fringes. The globe kept on. Men braced themselves for the strain that this time must come.

Now!

From eight men rose howls of anguish. Brend, pale behind his helmet, bellowed orders in a voice taut with pain as the penetrating cathode current touched to the quick nerves no man is aware of until caught in an open "cat" line.

"Juice off, *Argonaut!*" And again Brend voiced those choice expletives that were the pride of his hard-bitten crew, for even now, with the current still on, the reddish-white globe was drifting serenely through, the charged net.

Once beyond the mesh, it paused beckoningly.

"I'll be a tadpole, Cap, if the thing isn't thumbing its nose at us," murmured one man as the agonizing current died out.

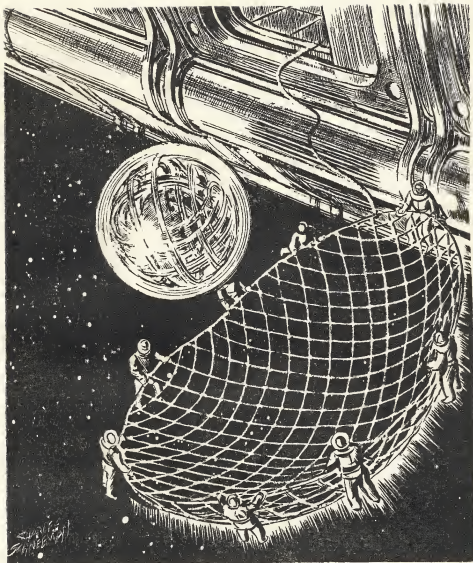
"Bilge-dust!" growled Brend. "What I'd like to know is how it opened the net circuit without damaging the mesh."

"Maybe it's that superhuman intelligence you're fond of telling us about," mocked a third voice. "In that case, captain, you can ask it—after you've caught it."

Brend grunted, rubbed his legs and thighs to restore circulation impeded by the cathode shock.

"Belay the net," he snapped. "Lectronbars out."

Skillfully the great net was folded away. Along the lines slid the lectronbars, gaunt of barrel and crazy



The thing—whatever it was—was finally maneuvered into the catching net and hauled inside.

with inductance drums and capacity batteries. Each man unsnapped one from the line and cradled it in one arm. Expertly, the eight hurled themselves, by means of repulsors, five hundred feet beyond their prey, then braked and faced about. At Brend's order the dazzling white of

an electron barrage sprang into being from the muzzles of the electron-bars. Slowly and in unison, the eight closed in.

And the globe, on the alert now, retreated before them.

Steadily the gap between men and ship narrowed. In the gigantic cup

of the barrage the globe spun and darted. The electronic field hemmed it in, hurled it back in shorter and shorter rushes, pinned it at last against the *Argonaut's* hull.

"Cargo!" shouted Brend.

Skillfully trained men pushed their captive into the cargo port, where others took over, and soon the globe was safely behind the tight door of Hold B, in that part of the ship evacuated of air for the handling of specimens taken in space.

"Congratulations, captain," remarked the voice that had spoken before. "That looked for a while like a tough assignment."

BREND TURNED from Hold B's observation window to see John Storm at his elbow. "It was just a bit too easy," he answered curtly.

"Come now, you don't think it played into your hands deliberately? You don't think this is your super-human entity at last?"

"We don't know a thing about it," replied Brend.

"Hope dies hard, doesn't it?" countered Storm. "Even in men like you, who should be first to realize that the old hopes are doomed. Ever since man first dreamed of reaching other worlds, it was to hope of finding a wisdom greater than his own and willing to spare him the pain of learning by bitter experience. But it wasn't in the cards. Venus was found peopled by cretins. Mars is an empty dust bowl, its canals mere tide rips caused by vanished moons before its crust cooled. Elsewhere life is common enough, but man still has almost a monopoly on intelligence. I'm afraid your super-intellect just doesn't exist."

Brend was staring into Hold B. The thing rested, a bubble of unknown substance, pulsing with inscrutable life, in midspace. He

switched off the fluorescents; in the dark the globe shone faintly.

"I've taken over two hundred specimens," he said slowly, "and never felt as I do about this one. I could almost believe the thing is laughing at us, that it could escape through the hull if it liked, that it stays at will—and at our expense."

Storm chuckled. "Who says spacemen are unimaginative? But if you put this thing above nineteen on the Baum scale, you're flattering it. Of course, its control of the cathode circuit was remarkable, but so was the electric eel's method of stunning its prey, old a million years before Volta built the galvanic pile. This creature lives in space, in an environment of cosmic rays, free electrons, and the like. Why shouldn't it have a limited control of subatomic forces? Such control needn't argue intelligence any more than does the eel's generation of electricity."

Brend shrugged, led the way through the air lock. In the ship proper he doffed his helmet, revealing a shock of red hair, an old-young face tanned by watches behind unscreened observation ports and engraved by wind and weather of more than one planet.

"Would you be willing to turn it loose?" he asked Storm abruptly.

The other laid down his helmet with exaggerated care. "Do you feel well, captain?"

"I mean it," said Brend. "I hired out to take specimens for you, but I'd feel better if that thing weren't aboard."

Storm's mocking good nature suddenly vanished. A man of about Brend's age, sandy-haired and blue-eyed, the set of his jaw now became challenging.

"The specimen stays," he said flatly.

Brend shrugged. "If you say so. I'll be on the bridge, if you should change your mind. We're laying by a couple of hours for Ferguson to make some observations."

Storm's answering grunt was more eloquent than speech.

NO DREADNOUGHT commander could have found fault with the *Argonaut's* bridge deck. The ship had been Brend's for five years, and unconsciously he straightened a little as he entered the control compartment, inhabited at that moment by Calloway, the second officer, and the ship's cat, Comet, a plain Earth feline of doubtful ancestry.

"Ferguson says he'll be a couple of hours still," reported Calloway. "Never took him that long before."

"Doesn't matter," said Brend. "We'll check our bearings meanwhile. What's our drift?"

Calloway gave it and Brend swung the transit in its gymbals for a sight on Jupiter. The cat scrubbed affectionately against his legs as he read the transit settings to Calloway, who punched a computing tape, ran it through the calculator, and announced the result.

Brend swung around for a check reading on the Sun. "Forty, sixteen minutes, ten seconds. Azimuth six point two—"

Calloway looked up in astonishment as Brend stopped. The transit dipped at an absurd angle. Brend was staring foolishly at his wrists. His eyes came up, met Calloway's in blank amazement.

The cat miaowed piteously of a sudden. Brend backed away from it, looked at Calloway like a man about to burst, opened his mouth twice without making a sound.

"Gord alive! What the devil does

this mean, sor?" he asked the astonished junior officer.

AT THE MOMENT Brend stepped upon the bridge, deck engineer Hobbs was cursing in fluent engineer-room English, the stupidity of oilers in general and Hoskins in particular.

"Number 3 runnin' dry, blast you, and the cap'n may be wantin' juice any minute. Look at them bearin's. 'Ot as hell and twice as shameful!"

Obediently, Hoskins went to work, thrusting himself and a long-snouted oil can halfway into the whining intricacies of the machine. Hobbs turned to his switchboard. For minutes the snarl and snap of oscillating inductors, the hum of air circulators and alternators, were the only sounds in the engine room.

And then it happened.

Hoskins straightened like a spring let go, leaped wildly back from that maze of flashing levers. There was a *thwack* of metal as the oil can was knocked from his hand, to roll into the drip pan and be hammered flat by the reciprocating field yoke, while the oiler stared dumbly.

"Seein' snakes, 'Oskins? Martian vipers, maybe?" suggested Hobbs caustically. "All thumbs you are. Finish up now, while I phone the bridge ready-all."

Grumbling, he closed the phone cubby door against the noises of the engine room. He could have reported by bridge signal, but when time permitted, took delight in phoning the "cap'n" personally. So Hobbs failed to notice that Hoskins did not finish oiling, but stood as though dazed. The fact escaped Hobbs even when he stepped out of the cubby, a sorely preoccupied man.

"You know wot?" he asked. "I says to the cap'n will he have a thousand kilos on the stern plates,

like usual, and 'e says, 'I dunno.' And I says wot the hell, only in other words, and 'e says, how should 'e know? I says, 'Sorry, cap'n, I didn't get that.' 'E comes back, 'I don't either, and I ain't the cap'n.' And 'e hung up! Wot I want to know, if 'e ain't Cap'n Brend—and I know the cap'n's voice, mind you—then who the devil is Cap'n Brend?"

The oiler turned a haggard face.

"I am," he answered.

THIRTY MINUTES later the men of the *Argonaut* assembled in the mess room, most of them curiously diffident and unwilling to meet one another's eyes. Brend found no need to ask for silence. It was already complete.

"Men," he began, "something almighty queer is going on aboard this ship. I've had the devil of a time getting you all together—and some of you know why."

"Wot he means," interrupted the man who seemed to be Brend, "is that I ain't the captain and he ain't me. Each of us is the other fellow."

Brend nodded, curiously shy in his enforced role of oiler. There was a general clearing of throats. Carson stepped forward.

"Yes, Carson?" urged Brend.

The man licked his lips. "I . . . I'm not Carson, cap'n. Thought you'd like to know. I'm Upton."

A voice spoke from the rear. "I'm Carson."

The silence deepened.

"What's this?" snapped Storm. "What are you trying to put over, Brend?"

"I'd be glad if you could tell us," Brend retorted. "The fact is something is playing hell with us psychologically. We ought to find out how far it's gone—take a sort of 'Who's

Who.' I'll call the roll—" The stolid features of Hoskins suddenly relaxed. It was the squeaky voice of Ferguson, the astrogator, that finished: "—if you'll let me have my notebook, Hoskins."

"You still Brend?" First Officer Roth inquired bluntly.

"Certainly," replied "Ferguson."

"Look at your sleeves."

Brend stared at the star-and-sex-tant insignia. "Merciful heavens! Now I'm Ferguson. I mean, I'm Brend, but—"

He relapsed into unprintable invective. Storm got up and left the room.

"Roll call is in order," snapped the pseudo-Brend suddenly. "Answer to your actual identity, regardless of anything else."

He paused to search his pockets.

"Notebook's on my . . . on your left hip," supplied the real Brend. "You aren't Hoskins any longer?"

"I'm Calloway, of course," was the reply. "No! Great galaxies, now I've switched!"

"Call the roll," barked Roth.

"Very well. Captain Brend?"

"Here," squeaked Ferguson's voice.

"Bates?"

"Here," responded Kemp, an oiler.

"Hobbs?"

"'Ere," answered Bates. "God 'elp me."

"Upton?"

"Present," replied Bates again.

"You just answered as Hobbs."

"Can't help it," the man returned. "I'm Upton."

Calloway closed the notebook. "We may as well give *that* up," he said bitterly. "This is a case for Mr. Storm."

"Storm's gone," volunteered a voice.

Brend swore whole-heartedly,

proving beyond all doubt that he was Brend, although the oaths came strangely in Ferguson's high-pitched voice.

"Hell's bells," said somebody. "Look at Jimson!"

All eyes turned to the big Negro cook. His were closed, and he was rocking back and forth where he sat, fists clenched, lips drawn back to reveal white teeth in an evil snarl.

Brend leaped up, locked an arm under the Negro's chin from behind. "Four of you grab his arms and legs. Never seen space fever before?"

THEY WERE scarcely in time. At their touch, Jimson's eyes opened. The great body gathered itself, lunged forward despite Brend's throttling grip. Again and again the men holding the Negro's legs were kicked away. His bloodshot eyes were open and staring. It was five minutes before his eyes closed and the convulsions ceased.

"He won't have them again," said Brend, "but he's dangerous. We'll have to lock him up. Wonder if he's really Jimson?"

"He suttinly ain't, suh!" indignantly offered the voice of Hoskins in the accents of Jimson.

Nobody answered. Jimson, the cook, was least of all likely to contract the homicidal madness that came from staring into space.

"Where is Storm?" asked Calloway-Brend. "He might help."

The Negro's eyes opened again, no sanity in them. He looked around the tense circle of faces and his lips lifted in the characteristic leer of the spacemad.

"I'm Ferguson," he said suddenly. "Dale Ferguson, astrogator. Hell is where the Sun is. Nobody knows I'm dead. But I'm going to kill them. Kill them all. And I won't tell!"

He grinned wolfishly, suddenly closed his eyes again.

"Sure, Dale, you'll kill them," said Brend soothingly, his glance commanding silence. "But how? How can you kill them? You aren't very big. But, of course, you're astrogator."

"Ferguson, astrogator," mumbled the Negro. "It was easy. All planned beforehand. They'll all be as dead as I am—but I'm safe. I can't die."

"Of course not," soothed Brend. "Tell us what you planned."

There was utter silence as the maniac's eyes shot open and stared suspiciously around the mute circle of men. Ferguson spacemad! The man whose calculations were responsible, more than any other's, for the safety of the ship! He might have been mad for days, cunningly plotting, with an insane conviction of his own immortality, the death of them all.

"*Meteor!*" whispered the Negro's lips. "Ninety-four hours away when I spotted it. Big enough to smash them dead. I killed them."

"When did it happen?" Brend murmured.

"I don't remember—only an hour now. It's beautiful, that meteor. Beautiful as death. The ship's drifting across its course." The madman's voice rose to a scream. "I'll kill anybody who says it isn't so."

Brend stood up. "That's enough. Lock him up—we'll treat him later. Calloway, Roth—to the bridge deck with me. The rest of you get to your flight stations."

CALLOWAY, still as Brend, and Roth in the person of Marston, an oiler, accompanied Brend to the observation bridge. It took them twenty minutes to compute the course of the barely discernible dot

approaching from sunward. An astrogator could have done it in ten.

"He wasn't lying," said Brend, gently kicking aside the cat, annoyingly intent upon affectionate gestures. "They rarely do at that stage. We'll get under way at once."

He punched the engine-room telegraph, was relieved to get back the "ready" signal. At his feet, Comet set up a dismal caterwauling. He reached for the "power-forward" button.

Sudden dizziness assailed him, so that he almost fell against the signal panel—but it wasn't the signal panel. He was leaning heavily against the brass railing before the engine-room switchboard. From their stations before the inductance switches, Hobbs and Carson stared at him curiously. He was sure they weren't Hobbs and Carson. Looking down at his own sleeves, he saw the twin-comet insignia of a second officer. He was, for the moment, Calloway. But Calloway had probably last been Hoskins. And Hoskins must now be—

Brend swore. A grin flickered over the pseudo-Hobb's face. "Thanks, captain. I'm Roth."

"You're dead!" screamed the third man suddenly. "You've got to understand you're dead, all of you—except me."

His lips writhed, and as Roth tried to approach him from behind he whirled, caught up and brandished a long wrench.

"You just don't want to die! There'll be a meteor and fiery particles when it hits—but first I must see that you don't get away."

He stared about wildly, then with one swift movement, thrust the wrench through the ventilating cage of a small high-tension alternator. Brend cried out hoarsely. There was a tremendous crack, a flash that

lit up the engine room like a flood lamp for an instant, and "Carson" sank to the floor.

Brend at once cut out the turbine drive to the alternator, and both he and Roth turned to the stricken man. There was a faint pulse, but his face was bluish.

"Adrenalin!" ordered Brend.

Roth found the drug in the engine-room medicine chest and Brend injected it. After a minute, "Carson" opened his eyes.

"Mr. Calloway! What's up with me? I feel like I crossed a live line, sure," he said.

"You did. Who are you?"

"Hobbs, o' course. I 'ope nothing's damaged—"

He fell silent at the glance that passed between the others.

"Jimson's locked up—but Ferguson is somebody else by now," snapped Brend. "He may keep changing. Pass orders that the men are to go about only in pairs—and to watch one another. May as well let Jimson go."

Roth departed on his errand. Brend helped Hobbs to his feet, pointed to the damaged alternator.

"Ferguson's work. Can we move without it?"

"No, *sirl*!" said Hobbs vehemently. "That's the exciter for the inductor fields. But maybe I can fix it."

"Get busy. You have about thirty minutes."

"THEY'RE watching each other," reported Roth, as Brend re-entered the control compartment. "Ferguson turned up as Kemp for a minute and tried to kill Hoskins, but when they pulled him off he wasn't Ferguson any more. There's no telling, of course, who he'll be next. Maybe we ought to give everybody a shot of metrazol."

"And have all hands in convul-

sions? No, we can't treat Ferguson until he stays Ferguson. Meanwhile, nobody must be allowed to stray off by himself—has Storm turned up?"

"I've put four men to searching for him."

"Good. Let's check that meteor again."

As Roth pushed open the door of the observation compartment, a furry streak launched itself from the top of the calculator, to land clawing on his shoulder. He cursed with pain and indignantly pulled Comet off, as the cat's claws found flesh. It scampered in circles for a moment, then rubbed heavily against Brend's legs, whining urgently.

Carefully the two men rechecked the course of the meteor, Brend at the telescope and Roth at the calculator. The first officer suddenly swore with vexation. Brend looked up to see Comet, again on top of the machine, making passes with one paw at Roth's head.

"She's driving me nutty," Roth groaned. "Can't we lock her up?"

"Have to catch her first," remarked Brend, for the cat had jumped to the floor and backed into a far corner.

"We've found Storm, captain," reported Bates, entering with Jimson. Between them they supported the figure of Storm.

"If he is Storm," added Brend. "Well, who are you?"

The man stared at him calmly, but made no reply.

"That's how he's been," said Bates. "Won't say a word. Can't walk, either—if we were in port I'd say he was drunk. We found him asleep on top of the main condenser. D'you think he's—"

"I don't know," said Brend heavily. "The two of you stay with him. If he begins to act like Ferguson, you know what to do." He stooped

suddenly, snatched up Comet, who had been rubbing stiff-legged against his ankles. "Somebody lock her up. She's a damned nuisance."

Jimson took the wriggling, squalling cat, and with Bates and the pseudo-Storm left the compartment.

"Looks bad," admitted Brend, when he and Roth had finished their computations. "Fourteen minutes to go—for Heaven's sake, Roth, don't take it like that!"

The pseudo-Hobbs had leaped from his chair before the calculator, his lips working. Brend backed against the wall, groped for the small brass-bound telescope affixed there.

"And 'ow should I take it, sor?" rasped the other. "How's a man to do 'is work when he's beside 'imself 'alf the time?"

Brend almost grinned with relief. "You're yourself now, Hobbs. I hope you're done with those repairs."

"Done!" snorted Hobbs. "Not by 'alf we ain't, wot with bobbin' around like we all are. Now I've got to go back. Wish I never came up 'ere in the first place. It's plain 'ell, sor."

"Aye," agreed Brend. "And if that exciter isn't running in thirteen minutes, it'll be worse—although I don't see how it could be. Send Roth back here if you find him."

Hobbs vanished, grumbling. Shortly Carson appeared. "I'm Roth, captain. I've seen that exciter—no chance of patching it up in time. Makes you wish for a couple of the old rocket tubes."

"How are the men taking it?"

"Well, Ferguson has them in jitters, of course. Next to him, the constant shifting of identities seems to bother them more than the meteor. Psychologically, I guess, it strikes nearer—"

A protracted and ghastly screech

cut him off. Brend burst into the control compartment with Roth at his heels, to face Jimson, who held Comet by the scruff of the neck with one hand and by the two hind legs with the other. A second demoniacal howl came from the cat's throat.

"What is this?" Brend roared at Bates, who sat with the pseudo-Storm on the floor.

"Dunno, cap'n. Jimson—he was Kemp then—went off to lock Comet up. Then he come back with her —"

"Nobody wants to die," complained the big Negro. "They won't let me kill them. Except the cat. She can't stop me."

His huge fingers clamped around the little beast's throat, heedless of her clawing and her piteous, throttled cries.

"I won't stand for that," muttered Roth, starting forward. Brend clutched his arm. Marston, in the doorway behind the Negro, suddenly caught the big man's arms from behind. The cat at once leaped to the floor and scuttled for safety, while all three men secured the viciously struggling pseudo-Jimson.

"Just as well this can't last much longer," muttered Roth, with a glance toward the glassite-inclosed observation turret. The meteor could now be plainly seen with the naked eye, apparently motionless, despite its terrific head-on speed. "Eight minutes more—"

COMET was brushing Brend's trouser cuffs vigorously, as though grateful for even that small respite, but when Brend looked down at her she backed away with mincing, high-lifted steps. Then, when sure of his attention, she suddenly leaped full upon the figure of the pseudo-Storm.

Storm instantly shrank back, his lips writhing back as Jimson's had a moment before, breath whistling between his teeth. Bates clutched him on one side, Brend at the other.

And the cat, leaping back, regarded all three with a quizzically urgent expression.

"Funny," said Brend. "He looked like Ferguson for a second." He spoke directly to Storm. "Who are you—not that it's going to matter, ten minutes from now, whether you care to say or not."

The man made no reply, but deliberately yawned, revealing a mouthful of excellent teeth.

"That's all he's done since we found him," supplied Bates. "Just yawn and want to lie down—on his belly if we'd let him. Cat's got his tongue all right—"

"*That's it!*" whispered Brend.

"What is?" asked Roth.

For answer Brend seized the cat, lifted her to the top of the calculator.

"*Are you Storm?*"

Comet nodded her head violently. Bates and Roth looked on dumfounded.

"Don't you see?" asked Brend. "We were all interchanged with one another, but Storm was put into the cat's body. And the cat in Storm's body—"

Comet nodded in a paroxysm of agreement.

"You found Storm—or what looked like Storm," Brend went on, "sleeping on top of the condenser. It's warm there, and Comet's favorite spot. She was too puzzled by the bigness of her new body to control it properly, so she went philosophical and tried to sleep it off. Storm wasn't so lucky. He couldn't tell anybody he was Storm, and we

were too confused ourselves to catch on. When I told Jimson to lock up what I thought was the cat, he picked that moment to turn into Ferguson. No wonder Storm howled. He *knew* he was in a bad spot."

The cat waved a paw and looked appealingly at Brend. A moment later it repeated the motion. With a gasp of comprehension, Brend offered it a pencil. The animal cocked its head at it, then reared up on its hind legs and stabbed the air frantically with both paws before it was obliged to come down on all fours. Seeing Brend still puzzled, it jumped to the floor and miaowed urgently before a closet under the chart table.

"The typewriter!" muttered Brend. Storm had borrowed it once when his own was out of order, and knew where it was kept. Brend put the cat and the machine upon the chart table, and inserted a sheet of paper.

Standing on three legs, the cat clumsily tapped out, with an occasional wrong letter: "i am storm. get all hands here quick."

Brend stared questioningly, whereupon, the animal added: "rush—emergency."

"Maybe we're all crazy," mut-

tered Brend, "but go ahead and do it, Roth."

Storm was typing again. "hurry. entity in hold deliberately responsible for personality changes. inform all hands—rush."

The cat paused, looked at Brend urgently.

Two by two, the men entered the control compartment, crowding the place from wall to wall.

"A man can't do no work aboard this ship," muttered Hobbs darkly. "If ye'd left me alone another forty minutes, cap'n, I'd have had that there exciter hummin'—"

"We've only got about four," Brend interrupted. "Men, as crazy as it sounds, Mr. Storm was switched with Comet, here, while what looks like Mr. Storm is simply the cat. That's a fact. Storm has just managed to tell us that the thing in Hold B is back of the mix-up of identities—"

"And a big help you were," growled Storm, shaking Bates' hand from his shoulder. "This farce might have ended an hour ago if somebody had listened to me."

He glowered about in his proper person, while Comet jumped off the table and disappeared under a chart shelf.

"You should all be yourselves



now," Storm said. "That was the understanding—look out!"

THERE WAS sudden commotion in the huddled group of men; it subsided with two husky oilers hanging to the arms of Ferguson, evidently himself again and as mad as ever.

"You mean that's all over?" asked Brend—as Brend.

"Quite," replied Storm. "It agreed to consider the incident closed if I could manage, while apparently the cat, to let you know my real identity and tell you that it was back of the whole thing."

"And who is it?"

"The thing in Hold B," snapped Storm tartly. "Actually it's a plural entity, the superhuman intellect you've always believed in, and it isn't in Hold B at all. The globe we see is only a three-dimensional cross section of its four-dimensional body, which isn't actually material. It's probably gone from Hold B by now, incidentally. As you thought, Brend, it allowed us to take it."

"How do you know all this?" asked Brend.

"I don't know. I remember walking out of the mess room, although I didn't *want* to leave. Then there's a blank, and later I came to as the cat. I knew things I couldn't remember learning. It—or they—were piqued by our treatment of it, and by my remarks especially. That was why it picked me for the goat, I suppose.

"It lives outside our space-time frame. The globe isn't native to our universe at all, but was simply exploring when we ran across it. Something about infinite or absolute time occurred to me, the ultimate of an infinite series in which it dwells, whereas we exist consciously in only one time extension which appears to us as primary time. Able to move

at will along the infinite serialism of time, it was able to shift our identities from outside the time-sequence normal to us among the space-time co-ordinates which are our bodies. I don't know why it did so, unless to teach us a lesson. I don't think it intended any harm—"

"Then it slipped up," said Brend grimly. "Look!"

All eyes turned to the observation window. The meteor, an irregular grayish mass, loomed balefully close. In utter silence they watched it swell in apparent size, with the calm of men who had faced death in thought long before and were prepared for the reality.

"Now!" shrieked Ferguson, grinning horribly. "All going to hell—except me. Don't you wish you were dead, too?"

"Wish he'd shut up," muttered Roth. "We could have let the men draw straws for the nine spacesuits on board—personally I'll take mine quick."

Brend made no answer. A mist was forming over his eyes. He blinked and the mist remained. Between ship and meteor it thickened, gleamed with brightening phosphorescence. He bit his lips, glanced at Roth, intently staring through the port. The mist limned Roth also, a tangible luminous fog here in the control compartment.

TANGIBLE! Something more than mist. Not something that might be seen or heard. Only the phosphorescent fog was visible. But Brend felt a presence, felt it as simply and irrevocably as pain is felt. It was something that required no words.

An ego, of childlike yet gigantic intellect—childlike because innocent of evil, gigantic in scope.

A brooding and immutable peace.

"Our brothers!" Space rang with

the words—or was it the thought of these words?

Brend never knew. He heard them plainly, but that might have been belief following upon perception. He stared into the effulgence that dazzlingly filled the control turret, and saw only light. But he felt—entity.

"Brothers, one of you has said that we were piqued by your behavior, but if he meant angered, he spoke inaccurately. You thrust yourself upon us, and in our curiosity we altered your conditions of existence, watched you struggle, and thwarted your efforts to learn what your further reactions might be. To one of you was given a problem, which he solved, bringing the test to an end. We had no intent to harm you, and it is our hope that you will feel no malice for what we have done.

"Now we see you faced with what you believe to be extinction, ignorant yet possessed of a courage our wisdom could not surpass. Ignorant, for unconsciously your identities extend throughout the infinite serialism of time even as ours, else we could not have disassociated those identities from the bodies to which they had become accustomed.

"What you call death is therefore impossible. Nevertheless, it may be your race has need of such courage as yours, and you shall return to tell of us. Such powers as propel your ship are warps in the fabric of space, which we are able to distend or collapse at will. We shall remove what threatens you. Perhaps we shall meet again. Life to you, brothers!"

With the last word, the mist vanished. The meteor, immense, incapable, all but filled the port. Brend judged it to be no more than

a mile away. As meteoric speeds go, a matter of a second or two—

Abruptly a fiery conuscation of sparks broke out upon it, outlined it for an instant in cold flame.

The same instant it was gone. Within the ship, silence held. Silence while long seconds ticked by, while men stared through the port and found it incredible that they were still alive.

Brend looked around and surprised a number of sheepish grins.

"Show's over," he said briskly. "We'll give Ferguson the metrazol treatment and have him around to normal in forty hours or so. Hobbs, you can finish your repairs now. We owe you a vote of thanks, Storm. I wonder if it would have saved us if you'd failed."

"I don't know," answered Storm.

"But you did know about the meteor all along, or you wouldn't have been in such a desperate rush."

"Meteor, hell," snarled Storm. "I was sweating blood—and not because of any damned meteor. The next time you take a cat aboard, you'd better investigate her character and condition."

"There's nothing wrong with Comet," said Roth stanchly.

"Might not have been," Storm growled, "if we hadn't stopped at the Martian fuel depot, where they keep a cat of their own—the other kind of cat. I tell you there wasn't a minute to lose—and I hope I never go through anything like that again as long as I live."

Brend grinned, snatched up a flashlight and peered under the chart shelf. When he stood up to face Storm, the latter's features were a deep red.

"Let's pass out quietly, men," said Brend softly. "Comet has become a mother!"

THE END.



SLACKER'S PARADISE

By Malcolm Jameson

Or it seemed that way till the commander of a space rowboat found a gigantic enemy battleship that was determined to surrender to him!

Illustrated by Jack Binder

At a corner table in Spider Hinton's place on Juno three young officers sat. One of them drummed continually on the table top with

restless, nervous fingers, and scowled about the place in obvious discontent. The other two were relaxed and appeared to be enjoying them-

selves as they toyed with the stems of their glasses and watched the girls begin to assemble. All three wore the slender silver badge of the crescent moon as well as the usual insignia of the Terrestrial Space Guard.

It was that crescent and what it signified that was what was so annoying to Lieutenant (jg) Alan MacKay, T.S.G.R.F., Class 5. In the parlance of officialdom it meant simply "an officer of limited qualifications," but to the impatient young MacKay and the public at large—and to the girls who entertained the Fleet, and to the personnel of the Fleet itself, *especially* to the personnel of the Fleet itself—it meant unqualified, untrained, unfit. It meant half-baked and incompetent. It meant that its wearer was quite likely to be a strutting young ass masquerading as a Guard Officer, quite imposing over the tea table, but a joke in the thermless void. And Alan MacKay resented that very much.

It annoyed him exceedingly that his apparently wonderful luck in having been commissioned and given command of an SP boat while still a junior at Yalnell was attributed to the powerful political pull of his mothersome Aunt Clara. For it was true. With Machiavellian cunning she had worked every wire to insure his having the highest possible rank and the cushiest possible jobs. He did not know it, though he suspected it from the fate of his monthly plea for more active duty, but the jacket that held his service record at the Department was plastered over with little notes clipped to it, such as, "Do not shift this officer to other duty without seeing me—JBH, High Admiral," "PD only," meaning planetary duty only, and the like. Whenever he thought of his Aunt Clara he cursed her softly

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under his breath, and not once did his conscience trouble him for his gross ingratitude.

The cabaret was beginning to fill up for the midday jamboree. Two girls stopped at the table for a moment. Ensign Hartley had waved them down just as they came in.

"Sit down," he invited, "and crook an elbow with us. We're off for the rest of the day."

"You! Humph," said one of them, tossing her head. "You'll keep for the dull times. Today there'll be real sailors here—fighting men." She gave a tug at her companion's arm. "Come along, deary—you can't afford to have *them* catch you hanging out with planet lice." They walked away.

"You asked for it, you damn fool," growled the other ensign, Terrell. "Didn't you read the board when we came in off patrol? The *Pollux* is coming in. She's all shot to hell from that big battle off the Trojans, on her way to Lunar Base for general repairs. Every man jack on her has been given the Nova rosette, and Captain Bullard rates a diamond clasp for his Celestial Cross. The best thing we can do is get out of here and make ourselves as small as possible until she shoves off."

"Yes," said Lieutenant MacKay, rising, grim and red of face.

He strode out of the room and into the locker room where their space-suits hung. Officers and men from the eight other SP boats were just coming in and taking off their armor so they could go onto the dance floor. MacKay nodded perfunctorily to one or two of them, then beckoned to his own two junior officers to follow him on outside.

"He may inspect us," he said, tersely, "get back on board and slick her up." To himself he added disgustedly, "we can't fight, but we can

shine brightwork—as if a man like Bullard cared a damn about shiny brass!”

For Bullard was to him what he had come to be to practically every young man and boy on the five planets—an idol. Who had not heard of his exploits in this tedious and long-drawn-out war between the Federation of Interior Planets and the Jovian Empire? And now Bullard was here! Alan MacKay winced. That meant he would have to meet him, for etiquette was rigorous. All junior ship commanders had to pay their respects to any visiting senior. He was at once elated and ashamed, for though he was a big, strapping fellow with a fine education, he bore that telltale crescent on his chest—the stigma of the unfit. What if he was commanding officer of the *TSS SP 331*? The bawdy songs of the Service and the old sky-dogs had but one translation for that “SP.” It was “Slacker’s Paradise.”

IT WAS in the same gloomy mood that Lieutenant MacKay watched the descent of the mighty monster of the void from alongside his own tiny craft parked outside the thin dome of Hebesport. He marveled at her size, and yet she was being brought down with an apparent ease and dexterity that amazed him. For the reports of her damage had not been exaggerated. Every plate of her showed signs of a fight.

Two-thirds of her false collision nose had been shorn off and what was left of it was covered with blue-scale, indicating it had been done with a fierce hydroxygen ray. Hardly a square yard of her skin but was patched with hastily riveted plates. One fin had been melted clean away and the slag from it hurled aft along her hull, where great frozen gobs of it still clung. A queer

and clumsy-looking jury-rig was where her jet-deflectors should have been, and a yawning hole in the bottom was all that remained of the nether turret.

But she came down neatly and without assistance from the ground force. MacKay continued to stare, wondering what she was like inside, for in common with his mates of the Juno Patrol, he had never set foot within a big ship. He had been told that she was packed from stem to stern with machinery and gadgets but he could not imagine such a quantity of machinery. His major subject in school had been interplanetary languages; what he had learned about physics and mechanics he had picked up on his little *SP 331*.

MacKay saw the groundport open and a man he knew must be Bullard step out, accompanied by several others. They had started across the field toward the entrance to the dome when suddenly they stopped in mid-field and turned their faces upward. A small ship was coming in from the opposite direction, and judging from the corona of bright flame all about it, it was furiously decelerating. Despite his short service and general ignorance on matters of the void, MacKay had learned to read that sign. It was one of the Council’s dispatch boats on special service. Nothing else was driven at that furious, tube-burning pace.

The Bullard party waited where they stood until it had landed, and they continued to stand there while a man sprinted across the field in huge bounds to them. MacKay saw Bullard take a white envelope from him, and turn it over and over in his hands as the messenger poured out some additional news with many gesticulations. Bullard at first shook his head, then nodded, and the man walked back toward his ship.

Whatever Captain Bullard had meant to do first, the arrival of this ship evidently changed his plans. Instead of continuing on to the dome, he abruptly altered his course and came straight toward where the line of SP boats lay. MacKay called a warning to his men within, and sent another flying down the line to rap on hulls and wake up the shipkeepers within.

Goose pimples arose on his skin as he stood and waited. His ship having come in first, had been parked farthest down the line, so that it was not until Bullard had inspected all the rest that he rounded the nose of the grounded SP boat and advanced straight upon MacKay. He answered the junior's salute briskly and asked:

"Permission to inspect you, sir?"

MacKay nodded dumbly, but he need not have. Bullard had already passed him and was inside. The SP 331's young skipper let the officers who were with Bullard go in first, then he followed. Bullard was already half through. He came out of the cubbyhole that passed for an engine room and into the control booth. He turned to one of his aids.

"Best of the lot, eh?"

The officer addressed nodded.

BULLARD CARESSED the knobs and buttons on the control panel with skilled fingers, then he glanced upward at the port bulkhead. A grim smile showed for an instant on his face, then he suppressed it. He looked full at the purple-faced MacKay, who was gasping like a fish out of water. There was a twinkle of questioning amusement in the eyes of the famous captain of the *Pollux*.

"One of my men, sir," blurted MacKay, blushing to the roots of his hair. "He got a transfer to the Fleet.

We felt we ought to put that up."

"That" was a small silk flag—a single red star on a pale-blue background. Its counterpart hung proudly in millions of homes on Earth, Venus and Mars. It was the current service flag. It meant that a member of the household had gone to the war.

"So," said Captain Bullard, "that's the way you feel about it?" The smile was off his face now, and his eyes were piercing and hard. They never wavered below the level of MacKay's own eyes, but the junior had the feeling that he was being studied from tip to toe. He got no clue from Bullard as to what the answer should be.

"Y-y-yes, sir," he gulped. "We do."

Captain Bullard continued to gaze at him relentlessly. MacKay felt that more was expected of him.

"Oh, sir," he exploded, "I didn't ask for this—it was a doting aunt—I've tried and tried, but they turn my letters down—it . . . it—"

"Enough!" said Bullard, hard as nails. "It is not what you do, but how you do it that counts. There is an old Earth saying, 'They also serve who stand and wait.' You know no gunnery, I daresay, nor one end of a torpedo from the other. You may lack much special knowledge that our profession requires. That is all your new moon means to me. But you know *something*. It is *how* you use that in a real emergency that matters—not what you ought to know."

Lieutenant (jg) Alan MacKay, T.S.G.R.F., Class 5, nodded miserably. It sounded reasonable—consoling even—but at the bottom of his heart he knew he was doing empty and useless and humiliatingly safe duty when the course of all history was at stake. Captain Bullard

whirled where he stood.

"I should like to speak to the lieutenant privately," he said, quietly.

When the others had withdrawn he addressed MacKay again.

"You are about to have your chance. You saw that messenger boat come in? She is a virtual wreck. She cannot be repaired for days. But her captain has delivered me a message that must go on. It is highly secret and urgent and must not be sent through the ether. It must be delivered to the commander in chief by hand, or failing that, orally. He is now hovering off the Jovian System maintaining our blockade there. How soon can you start?"

"Within the hour, sir," answered the startled MacKay. Now that he had received what he had been begging for, he was frightened. Was he good enough? Could he do it? What if he failed?

But Bullard showed no hesitation. He produced an envelope that MacKay saw was sealed with heavy state seals.

"This," said Bullard, "is written in plain English, not enciphered code, and there is a reason for it. That 'MR' in red letters on the lower front corner means at 'messenger's risk.' That is your authorization, if threatened with capture or loss of the document, to open it and read it until you have memorized its contents. Then you are to eat it, or otherwise completely destroy it. After that, you must use every effort to deliver it to the commander in chief, suffering torture, if required, rather than divulge its purport. Are you ready to undertake that?"

MacKay looked into the steely eyes. He saw something he could not evade. That question was not a query—it was a command.

"I am," he said simply, and held out his hand for the message.

"You will give me your receipt, please," said Captain Bullard, evenly.

Lieutenant MacKay's hand trembled as he wrote out the receipt, but as he handed it across he was rewarded with a friendly smile from the man he had so long admired—and but a moment ago had feared.

"Remember"—Bullard glanced down at the paper—"Mr. MacKay, if you are caught by the enemy, you are on your own. All will depend then on your own judgment and your capacity for action. You have a great responsibility. Do not be afraid to exercise it. Bear in mind that in a grave emergency, *any* action is better than inaction."

MacKay was vaguely aware of a warm grasp of the hand, a slap on the shoulder, and his boyhood hero was gone. A second later he had snapped out of it and was holding the general alarm button hard down. There was much to do to make ready to hop off within the hour.

MACKAY looked back once, after he had cleared Hebesport. The dome with the depot and cabaret under it looked like a dime on the sidewalk seen from a five-story window, and the black ships lying on the ozone snow outside like flies—one big one and the rest dots. He had told neither Hartley nor Terrell where they were going or why. He had only set the course and promised to explain in due time. Hartly was the assistant for astragation, and Terrell's job was handling the motors. As a relief for Hartley, there was Red Dugan, the scarlet-haired, freckle-faced quartermaster. Terrell's helper was Billy Kelsey, the radio-man, better known as Sparks. Sparks alone of them did not wear the silver crescent. He was an old

Fleet Reserve man, having done his time long ago in the early Martian Wars.

Until that moment, Mackay had never felt the weight of responsibility. The *SP 331* was much like his own yacht in its general characteristics and he had never had any misgivings about his ability to handle her. Her armament was so inadequate as to never have given him a qualm. It consisted simply of a 10 mm. needle gun, fit only to detonate a stray mine. The *SP* boats were designed simply to patrol, not fight. But now she might have to fight or run, and since she could not do the former, it left no choice but the latter. And that, a swift computation showed, was almost as impossible.

MacKay was still trying to figure out how with his low rocket radius he could make the best possible speed to the Fleet and still keep back enough fuel in reserve to enable him to duck an emergency, when suddenly the emergency came. It was Red, the quartermaster, who announced it. He had been exploring space ahead with the not too sensitive old Mark I thermoscope the *SP 331* was fitted with.

"There's something ahead, something big," he reported. Red pulled the book to him that contained the resultant patterns of various combinations of infrared rays originating from mixed substances. He puzzled over the cross-index until he came to the type figures that matched those visible on the face of the thermoscope. He read out of the book:

LT-348-501, surcharged with F type spots: an atomic-powered type BBB with propulsion cut, but auxiliaries running. Usually indicates five units distance at normal intensity. Apply inverse square rule for other readings.

That could only mean a Jovian battleship of the most powerful class, lying to in the vicinity! For the Federation boasted nothing bigger than the highly specialized star-class cruisers, such as the *Pollux*.

Almost in the same moment, the televox came to life with a sputter and a crackling. A guttural voice was speaking:

"*Phraedon? Sezrik ng aut flotzkrigen zub smugelbisker! Phraedon?*"

"What is that?" yelled Hartley.

MacKay listened as the message was repeated. He knew the Jovian dialects better in written form than by ear.

"He wants to know if we are Terrestrials. He says if we are, to come alongside and arrange surrender."

As he spoke he twisted the jet-deflector to hard dive and hard right. Simultaneously he jammed down the button that released maximum rocket power.

"Handle her, Hartley, I've got a job to do."

THE REALIZATION that he had failed at the one real mission he had been assigned almost bowled MacKay over. His vocal cords felt tense and paralyzed, and cold sweat stood out on his forehead and more trickled down his ribs, but he knew the hour had come to destroy the important message. Yet he hesitated. Had he really been overhauled by a Jovian? For how could a Jovian, no matter how big, elude the clouds of cruisers that swarmed about Jupiter and his planets?

He paused, irresolute, with his fingers still on the flap of the sealed envelope. Sparks flung open the door of the radio booth and stuck his head out.

"Message coming through from *Pollux*. I'll give you the decode in a jiffy." He slammed the door.

"How are we doing?" MacKay asked Hartley, nervously.

"Rotten," said Hartley. "She's come into sight—big brute, with black and white checks on her sides—she's piling on the power now."

Sparks stepped out of the booth. The slip he handed MacKay read:

For your info: INTERCEPT Dir-Gen to o-IN-c: Complete retirement as previously ordered. Await further orders at Mars Base. Messenger ship note changed destination.

MacKay waited no longer. His trembling fingers tore open the precious envelope and he took out the flimsy single sheet of paper it contained. He knew now that the blockade had been abandoned for some reason unknown to him and the Jovian fleet was free to come out. He spread the paper open and read.

He skipped the flowery heading. It was from the Grand Federated Council to the commander in chief. The first paragraph was full of flattering words about how well the fleet had done. The second spoke of the hardships endured by the three planets during the long war, and of the millions of men lost and the trillions of sols spent. Taxation was now unendurable. The third paragraph read:

Until now we had hoped that our blockade would win eventually, but late information advises us that the *flerig* crops on all Jovian satellites are bumper ones this year, and that herds of *leezvartle*, under intensive breeding, are actually larger than at the beginning of the war. Since the enemy has unlimited resources of minerals, it is clear that we can no longer hope to win. Hence the order for your withdrawal.

Inform his Imperial Majesty that a peace commission is being sent and request an immediate armistice. Advise him our terms in general will be the following:

Recognition of Jovian dominion over all outer planets and satellites; division of asteroids to be determined by conference, as well as the amount of indemnity we shall pay—

MacKay had turned pale. It was monstrous, shameful! That the Federation should weaken now, after having relieved half the suffering planets controlled by the ruthless and aggressive Callistans and won all the major battles of the war, was unthinkable cowardice. Why, they were giving the Jovian Emperor—self-styled, for in the beginning he was only a Callistan soldier of fortune—more than even he had ever hoped to gain. And the ultimate in degradation was that unsolicited and ignominious offer to pay indemnities!

He ran through the incredible message once more. Then the *SP 331* lurched violently.

"They've hooked us with a tractor beam," shouted Hartley. MacKay tore a strip from the Council's message and rolled it into a pellet which he popped into his mouth. He followed it with another and another. By the time the small patrol vessel was locked against the captor's spaceport, he had swallowed the last of it. Its many-sealed cover had been reduced to black ashes, which he slowly crumbled between his fingers.

The televox came to life with:

"*Lu supnitte af trelb vittervang*
—*LOSHT!*"

"They're damned polite," muttered Lieutenant MacKay, as he buckled on the gold-hilted dagger that was the ceremonial descendant of the sword. "Will his excellency have the kindness to come on board—PLEASE!" he mimicked, bitterly.

TO SAY that Lieutenant (jg) Alan MacKay was surprised when he stepped out of the *Draval's* inner lock would be to commit a gross understatement. He was, to be most exact, simply flabbergasted.

Eight side-boys lined the passage,

and a rank of four musicians, tooting the raucous *zibl* pipes that give Ionic music its particularly ghastly effect, were rendering full imperial—if distinctly cacophonous—honors. Two gigantic drummers battered out the ruffles. Beyond them stood a gold-laced admiral and his staff, all of them gaunt and emaciated-looking, but rigged out in all their finery.

MacKay saluted clumsily. He was astonished to see the admiral bow deeply, and in the doing, unhook his own poniard from its clasp. When he straightened up from his obeisance, he took two steps forward and handed the swordlet to MacKay.

"Pliss," he said, "you take it. Ve het ver' grit tribble ta scap—bat Trestians alright. Now ve gat lifeboats ant go away. Maybeso lo gat *Draval* other time, no?" He looked appealingly at MacKay.

"I think we will do better if we converse in Ionic," suggested Lieutenant MacKay, glancing stupidly at the token of surrender he held. He did not quite know what to do with it. Impulsively he handed it back to the admiral. "Do I understand that *you* are surrendering to *me*?" he asked, still unbelieving.

"Yaas," said the admiral, and with another sweeping bow, indicated he might come farther into the ship to hear the reasons.

They walked down a long glittering passage. On either side MacKay had glimpses through explosion-proof glassite bulkheads of masses of monster vacuum tubes; banks of condensers and transformers; immensely intricate bits of machinery composed of strangely arranged helixes, glowing spheres, and literally miles of glistening wires. He had not the faintest notion of what any of the machines were called or what their function.

The admiral led the way into a

luxurious office and sat down wearily. He seemed very weak. All his suite had mysteriously disappeared.

"We destroyed our consort—a ship that was manned wholly by Callistans, and killed all the Callistan officers we had on board. We managed to elude your most effective blockade, and got this far, but I am afraid we cannot go farther. It is for that reason I place the ship under your protection."

MacKay blinked. *His* protection! He thought feebly of the *SP 331's* 10 mm. micro-Bertha. It was too silly, too wacky. This was all a dream. But the admiral talked on, earnestly and pleadingly. MacKay was brought back to a sense of reality by a series of quivering jolts that momentarily shook the ship.

"My staff and remaining crew taking off in the boats," explained the admiral. "They are holding one for me. I must get back as soon as possible."

"B-but—"

"I am Jallikat—you may have heard of me—I was one of the first who advocated a union of the Jovian satellities. I had no idea, of course, how tyrannical the Callistons would prove to be, or what a fantastic madman they had for a leader. I need not relate how Europa and Ganyমে were induced to join us, or our subsequent conquests elsewhere. But all that is over. The empire is an empty shell and overripe for destruction. The *flerig* crop is a complete failure. Our once vast herds of *leezvartle* have been slaughtered to the last animal—"

MacKay gave a start. It was an example of what skillful propaganda could do to unman an enemy.

"The Callistans have more local revolts on hand than they can manage. In another day they will collapse, for the people are starving.

Your blockade, my young friend, has beat them.

"You wonder why I bring you this battleship. I will tell you. We have listened to your director and we trust him. He has said that the war aims are for the liberations of the subject peoples. Very well, when that day comes, I will need a fleet, and we wish these ships which have always been manned by Ionians, to be spared as a nucleus for our future nation. We do not so trust your allies, the Martians. They would either add them to their own navy, or destroy them to keep them out of other hands."

The admiral smiled hopefully.

"Now that I have delivered it safely into your hands, may I have your permission to go back to my people?"

"Why, certainly," said MacKay, perfunctorily. He was too dumfounded to add anything to that. Almost before he knew it, the admiral had gone. A moment later there was one last thudding jolt. Lieutenant (jg) Alan MacKay felt a peculiar tingling all over his body. He—a wearer of the crescent—was in complete command of the biggest battleship of the skies. It was an empty and crewless battleship, to be sure, but only yesterday even ships like the indomitable *Pollux* would not have dared approach it except in divisions of six. It made him feel a little faint.

MACKAY pulled himself together and walked out into the passage. He was not certain by what way he had come, for there had been several turnings. The ship was vast and strange, and eerie in its silence. But after several false tries, which humbled him further, he found the air lock. He straightened up and

drew a deep breath. Five seconds later, he stepped down into the eighty-eight control room of the microscopic *SP 331*.

"No kidding, fellows," he announced in a pathetic effort at being nonchalant, "but we have captured a battleship. Leave this little thing as she is and let's go aboard and look her over."

Four pairs of eyes stared at him, and four sets of lips twitched into incredulous grins. After a moment Terrel spoke up.

"O. K., I'll bite. What's the gag?"

"I mean it," said MacKay, seriously. "The gag is that there is not a soul on board her nor a bite of anything to eat. How she's fixed for fuel or anything else is something we don't know. Our first job is to find out."

They explored that ship like miners exploring a new-found cave. Time after time they became lost, or wound up in blind passages. It took the best part of an hour before they came to the control room, embedded behind thick armor in the very bowels of the ship. MacKay found a set of plans and dragged them out. Hastily he translated some of the more important symbols on them for the guidance of his helpers.

"Here," he said to Terrell, "this is the motive-power layout as well as of the auxiliaries. Take Red with you and see if you can dope out what makes this ship move and how to keep the lights and things on. You'll have to stand watch and watch when you do. Report back in an hour or so, in any case. Have Sparks locate the radio and let me know the minute he can start sending. You, Hartley, take this set and have a look-see at the magazines. I wouldn't be surprised if the powder

hasn't gone sour. If it has, flood or smother. Look for labels on the wall alongside locked valves. 'Belligish' something or other is what you'll find—it means 'to extinguish.' I don't see how you can go wrong if you turn one on.

After they had gone, MacKay made a cursory examination of the control room. Its thousands of gadgets must have taken a score of men to operate, and very little of it meant anything to him, accomplished yachtsman though he was. He gave up the job and busied himself with examining the more important of the ship's papers.

What they contained was ample confirmation of what the admiral had said. Request after request for vital supplies had been turned down, or ersatz material sent in its place. Much of the correspondence dealt with the failure of the supposedly "just as good or better" substitutes. He felt better over his instructions to Hartley when he learned that half the ship's magazines had already been smothered on account of deteriorating powder.

But the question that pressed relentlessly on his brain was the big one. What should he do about that message? Abandon this hulk and go on in the *SP 331*? Or had the news he had just come by altered the situation so materially that it did not matter whether the message was delivered? He decided to radio Terra, giving the news he had just acquired, and ask for further instructions, even though according to the code, no messenger was permitted to query his orders.

That idea was knocked in the head as soon as it was conceived. Sparks came in.

"I found it," he said, "and it works. I traced back and followed a lead

into here. You can start sending any time now. Use that set over there." He pointed to a panel half-concealed by a huge switchboard. "Here's something interesting I found—a complete set of all our codes and ciphers! Wouldn't that burn 'em up at GHQ? Here are a few—you'll notice they are printed in Jovian thin-line type—guess they issued them to all their ships."

MacKay frowned. If the Calistans had all their codes, he could not hope to communicate confidentially with the director, the *Polux*, or anyone else. Should he indicate that revolution was on the verge of breaking out in Jovia, the emperor might stamp it out before the Earthmen and allies could help. Yet the information he had in his possession was incredibly valuable. Had the Council had it a few days earlier, they would never have sent their pusillanimous peace offer. If they had it now, they would surely recall it.

"Hold everything," said MacKay, and sat down to think. His brain felt numb and his skin was tingling again. He was almost afraid to face the fact that was every moment forcing itself more and more into the foreground. It was that at that moment he—he, the lowly junior grade lieutenant of Class 5 of the Reserve—held the fate of the Solar System's peoples in his hand. Upon what he did next—or failed to do—everything hung. No matter how slight his action, the repercussions would be interplanetary. It was a crushing thought to one who had never had to make a major decision and stand by its consequences.

It was only a matter of a minute or so that he sat there in sober study, though to him it seemed much longer. He groaned. "Oh, if I only knew,

What would a man like Bullard do? He would do something, I bet."

The thought of Bullard was tonic. The picture of the man came up before him, vivid and clear. He could almost hear him talking, and the exact words of that memorable interview came back to him. They were strangely prophetic.

"It is *how* you use what you know that counts in an emergency—you may be on your own—all will depend on your own judgment and capacity for action—do not be afraid to exercise it—any action is better than none."

That was the gist of it. That was the Bullardian philosophy in a nutshell. Act! Damn the torpedoes; go ahead! Cut the Gordian Knot, if there was no other way.

LIEUTENANT MACKEY made up his mind. They might hang him for high treason, but what he was about to do was, to the best of his sincere judgment, the only thing to be done under the circumstances. It was what the peoples of all the worlds of the System hungered for. When he spoke again it was with a firm steady voice and flashing eyes.

"Sparks! Start sending—reserved State wave length—priority symbol—urgent. 'From the Council of the Federated Planets to the Emperor of Jovia. Sir. Within the next twelve hours you will by decree grant whole and unconditional freedom to all your subjects beyond the confines of the planetoid Callisto. You will at once recall and immobilize all strictly Callistan war craft. To permit the orderly doing of this we have temporarily withdrawn our forces. Should you fail to comply within the time set, we shall resume the assault.' Let's see, I think that covers it. Sign off with the usual high seal

symbol. You know the one. Got it?"

"Yep," said Sparks, his hand steadily pounding away. "All gone. Now what?" The grizzled old radio man had something like admiration in his eyes, though he could only guess the story behind what was transpiring.

"Give me the key. I'm a bum operator, but nobody can do these sneezes but me. I doubt if you could even read them."

MacKay sat down. All his self-consciousness had evaporated. He was plunging along now, and letting the chips fall where they might. He might make ridiculous errors in plain code, or Ionic or Ganymedian grammar, but he didn't care. If the idea got across, that was enough. It did not matter now about his ignorance of gunnery, or engineering, or anything else nautical. He was using the thing he did know—planetary languages.

For an hour he sat, jabbering forth dramatic appeals to the Ionians, the Europeans and the others to arise and drive out their conquerors. He told how the crew of the *Draval* had done it, and said she was waiting for them to join her. He promised the support of Terra, and the quick return of the Federated Fleet to aid them if they only showed resolution. He went on and on, his hand never ceasing. It was Sparks who broke him off.

"A call on another wave, sir. It's from Admiral Alley Cat, or something that sounds like that. He says knock it off—it's all over. They've dug a bird somewhere that knows English. Anyhow, he's on the way here."

MacKay slumped back in his seat. He had not known how tired one could get merely flicking the hand.

But there was another clicking starting up. It was on the high State wave he had just been using. He listened.

"Urgent for Pollux. If you possibly can, turn back and find the SP 331 you used for messenger. Her operator is stricken with cosmopsychosis and is sending wild and extremely damaging messages. Suppress him even if it involves destruction of the patrol boat.

"Signed, DIRECTOR."

"Oh, gosh," said MacKay, "now I've got to start explaining. You do it—I'll dictate."

When the full story was on the ether, MacKay was in a state of virtual collapse. He looked with a dull eye upon Terrell who came in to report that the power installation was miles beyond his comprehension, though he did think they would have lights for a while.

"It doesn't matter," said MacKay, wearily, and closed his eyes. The issue would be determined then.

It was the next day that Admiral Jallikat brought his squadron up. There was the *Tschasnick*, the *Perl*, and the *Bolonok*, all battleships, four cruisers and a number of lesser craft. The admiral promptly sent over enough men to man the *Draval* and get her under way. She picked up speed sluggishly and headed Earthward to the point where the *Pollux* was limping back, trying to intercept them.

"I'll go ahead in the SP 331," said MacKay, the moment the messenger reported the *Pollux* had been picked up by the sensitive thermoscopes of the big ship. "It is I, and I alone, who have to face the music."

LIEUTENANT (jg) Alan MacKay left his tiny SP boat tied up to the

Pollux's entry port and silently followed the commander who had admitted him toward Captain Bullard's cabin. He entered and stood just inside the door, waiting anxiously for what the captain had to say. He was not happy.

Bullard rose from his desk and walked forward without a word until he came face to face with the young officer, and not a foot away. He reached out his right hand and with two fingers seized the silver pin on MacKay's chest. With a single resolute yank, he ripped it away and a bit of the cloth came with it. Without looking at it he flung it backward across the room.

"I'm sorry about the tear," said Bullard quietly, "I did not mean to be quite so vigorous. But here, this will cover it—"

From his own breast he unpinned the broad, star-spangled gold-threaded ribbon of the Celestial Cross.

"After all," he said, and this time he smiled, "you won a war, whereas all I won was battles."

Note:

The seemingly incredible situation in the middle portion of this story occurred in almost identical fashion during the 1st World War, in 1918.

A pair of Austro-Hungarian battleships—the *Zrinyi* and the *Radetsky*—surrendered to an American sub-chaser. Their condition was the same, and their purpose was the same. The crews were Dalmatians and foresaw the dismemberment of Austria and hoped for the establishment of a Dalmatian Republic. They refused obstinately to surrender to either Italian or French ships, though they were both in the Adriatic. They insisted on finding an American captor, as they were hopeful that we would return the ships to them as a nucleus for their own fleet. The biggest they could find was a sub-chaser.

The young lieutenant who took over the *Zrinyi* was just out of college and had never been on board a battleship. There was no food but the ersatz stuff left by the Austrians. It took them days to make out what was what, as the crew promptly deserted as soon as the ship was safely under the American flag. But the American kids hung on, and managed to keep steam up and run the ship until the Peace Treaty finally disposed of it.

The Italians eventually got them, and used them for targets. They were like our Connecticut. M. J.

NOT THE FIRST

By A. E. van Vogt

The tale of a ship sent out to explore the depths of space, the first beyond man's Solar System—and, it might be, the ultimate last!

Illustrated by Jack Binder

CAPTAIN HARCOURT awakened with a start. In the darkness he lay tense, shaking the sleep out of his mind. Something was wrong. He couldn't quite place the discordant factor, but it trembled there on the verge of his brain, an alien thing that shattered for him the security of the spaceship.

He strained his senses against the blackness of the room—and abruptly grew aware of the intensity of that dark. The night of the room was shadowless, a pitchlike black that lay like an opaque blanket hard on his eyeballs.

That was it. The darkness. The indirect night light must have gone off. And out here in interstellar space there would be no diffused light as there was on Earth and even within the limits of the Solar System.

Still, it was odd that the lighting system should have gone on the blink on this first "night" of this first trip of the first spaceship powered by the new, stupendous atomic drive.

A sudden thought made him reach toward the light switch.

The click made a futile sound in the pressing weight of the darkness—and seemed like a signal for the footsteps that whispered hesitantly along the corridor, and paused outside his door. There was a knock,

then a muffled, familiar, yet strained voice:

"Harcourt!"

The urgency in the man's tone seemed to hold connection to all the odd menace of the past few minutes. Harcourt, conscious of relief, barked:

"Come in, Gunther. The door's unlocked!"

In the darkness, he slipped from under the sheets and fumbled for his clothes—as the door opened, and the breathing of the navigation officer of the ship became a thick, satisfying sound that destroyed the last vestige of the hard silence.

"Harcourt, the damnedest thing has happened. It started when everything electrical went out of order. Compton says we've been accelerating for two hours now at Heaven only knows what rate."

There was no pressure on him now. The familiar presence and voice of Gunther had a calming effect; the sense of queer, mysterious things was utterly gone. Here was something into which he could figuratively sink his teeth.

Harcourt stepped matter-of-factly into his trousers and said after a moment: "I hadn't noticed the acceleration. So used to the—Hm-m-m, doesn't seem more than two gravities. Nothing serious could result



"There's less than twenty minutes now to get that functioning—and the star to end us if you don't."

in two hours. As for light, they've got those gas lamps in the emergency room.

For the moment it was all quite convincing. He hadn't gone to bed

till the ship's speed was well past the velocity of light. Everybody had been curious about what would happen at that tremendous milepost—whether the Lorenz-Fitzgerald con-

traction theory was substance or appearance.

Nothing had happened. The test ship simply forged ahead, accelerating each second, and, just before he retired, they had estimated the speed at nearly two hundred thousand miles per second.

The complacent mood ended. He said sharply: "Did you say Compton sent you?"

Compton was chief engineer, and he was definitely not one to give away to panics of any description. Harcourt frowned: "What does Compton think?"

"Neither he nor I can understand it; and when we lost sight of the Sun he thought you'd better be—"

"When you *what*?"

Gunther's laugh broke humorlessly through the darkness: "Harcourt, the damned thing is so unbelievable that when Compton called me on the communicator just now he spent half the time talking to himself like an old woman of the gutter. Only he, O'Day and I know the worst yet.

"Harcourt, we've figured out that we're approximately five hundred thousand light years from Earth—and that the chance of our ever finding our Sun in that swirl of suns makes searching for needles in haystacks a form of child's play.

"We're lost as no human being has ever been."

IN THE utter darkness beside the bank of telescope eyepieces, Harcourt waited and watched. Though he could not see them, he was tautly aware of the grim men who sat so quietly, peering into the night of space ahead—at the remote point of light out there that never varied a hairbreadth in its position on the crossed wires of the eyepieces. The silence was complete, and yet—

The very presence of these able men was a living, vibrating force to him who had known them intimately for so many years. The beat of their thought, the shifting of space-toughened muscles, was a sound that distorted rather than disturbed the hard tensility of the silence.

The silence shattered as Gunther spoke matter-of-factly:

"There's no doubt about it, of course. We're going to pass through the star system ahead. An ordinary Sun, I should say, a little colder than our own, but possibly half again as large, and about thirty thousand parsecs distant."

"Go away with you," came the gruff voice of physicist O'Day. "You can't tell how far away it is. Where's your triangle?"

"I don't need any such tricks," retorted Gunther heatedly. "I just use my God-given intelligence. You watch. We'll be able to verify our speed when we pass through the system; and velocity multiplied by time elapsed will—"

Harcourt interjected gently: "So far as we know, Gunther, Compton hasn't any lights yet. If he hasn't, we won't be able to look at our watches, so we won't know the time elapsed; so you can't prove anything. What is your method, if it isn't triangulation—and it can't be. We're open to conviction."

Gunther said: "It's plain common sense. Notice the cross lines on your eyepieces. The lines intersect on the point of light—and there's not a fraction of variation or blur.

"These lenses have tested perfect according to the latest standards, but observatory astronomers back home have found that beyond one hundred fifty thousand light years there is the beginning of distortion. Therefore I could have said a min-

ute or so ago that we were *within* one hundred and fifty thousand light years of that sun.

"But there's more. When I first looked into the eyepiece—before I called you, captain—the distortion *was* there. I'm pretty good at estimating time, and I should say it required about twelve minutes for me to get you and fumble my way back in here. When I looked then the distortion was gone. There's an automatic device in my eyepiece for measuring degree of distortion. When I first looked, the distortion was .005, roughly equivalent to twenty-five thousand light years. There's another point—"

"You needn't go on," Harcourt interjected quietly. "You've proved your case."

O'Day groaned: "That'll be maybe twenty-four thousand light years in twelve minutes. Two thousand a minute; that'll be thirty light years a second. And we've been sittin' here maybe more'n twenty-five minutes since you 'n' Harcourt came back. That'll be another fifty thousand light years, leavin' one hundred thousand light years, or thirty thousand parsecs between us 'n' the star. You're a good man, Gunther. But how will we ever identify the blamed thing when we come back? It would be makin' such a fine gun-sight for the return trip if we could maybe get another sight farther on, when we finally stop this runaway or—"

Harcourt cut him off grimly: "There's just one point that you two gentlemen have neglected to take into account. It's true we must try to stop the ship—Compton's men are working at the engines now. But everything else is only preliminary to our main task of thinking our way back to Earth. We shall probably find it necessary, if we live,

to change our entire conception of space.

"I said—if *we live*! What you scientists in your zeal failed to notice was that the most delicate instruments ever invented by man, the cross lines of this telescope intersect directly *on* the approaching Sun. They haven't changed for more than thirty minutes, so we must assume the Sun is following a course in space directly toward us, or away from us.

"As it is, we're going to run squarely into a ball of fire a million miles plus in diameter. I leave the rest to your imaginations."

THE DISCUSSION that blurred on then had an unreal quality for Harcourt. The only reality was the blackness, and the great ship plunging madly down a vast pit toward its dreadful doom.

It seemed down, a diving into incredible depths at an insane velocity—and against that cosmic discordance, the voices of the men sounded queer and meaningless, intellectually, violently alive, but the effect was as of small birds fluttering furiously against the wire mesh of a trap that has sprung remorselessly around them.

"Time," Gunther was saying, "is the only basic force. Time creates space instant by instant, and—"

"Will you be shuttin' up," O'Day interrupted scathingly. "You've had the solving of the problem of our speed, a practical job for an astronomer and navigation officer. But this'll be different. Me bein' the chief of the physicists aboard, I—"

"Omit the preamble!" Harcourt cut in dryly. "Our time is, to put it mildly, drastically limited."

"Right!" O'Day's voice came briskly out of the blackness. "Mind

ya, I'm not up to offerin' any final solutions, but here may be some answers:

"The speed of light is not, accordin' to my present thought, one hundred eighty six thousand three hundred miles per second. It's more'n two hundred thousand, maybe fifty thousand more. In previous measurements, we've been forgettin' the effect of the area of tensions that makes a big curve round any star system. We've known about those tensions, but never gave much thought to how much they might slow up light, the way water and glass does.

"That's the only thing that'll explain why nothin' happened at the apparent speed of light, but plenty happened when we passed the real speed of light. Come to think on it, the real speed must be somethin' less than two hundred fifty thousand, because we were goin' slower'n than when the electric system blanked on us."

"But man alive!" Gunther burst out before Harcourt could speak. "What at that point could have jumped our speed up to a billion times that of light?"

"When we have the solvin' of that," O'Day interjected grimly, "The entire universe'll belong to us."

"You're wrong there," Harcourt stated quietly. "If we solve that, we shall have the speed to go places, but there's no conceivable science that will make it possible for us to plot a course to or from any destination beyond a few hundred light years.

"Do not forget that our purpose, when we began this voyage, was to go to Alpha Centauri. From there we intended gradually to work out from star to star, setting up bases where possible, and slowly working out the complex problems involved.

"Theoretically, such a method of plotting space could have gone on indefinitely, though it was generally agreed that the complexity would increase out of all proportion to the extra distance involved.

"But enough of that." His voice grew harder. "Has it occurred to either of you that even if by some miracle of wit we miss that Sun, there is a possibility that this ship may plunge on forever through space at billions of times the velocity of light.

"I mean simply this: Our speed jumped inconceivably when we crossed the point of light speed. But that point is now *behind* us. And there is no similar point ahead that we can cross. When we get our engines reversed, we face the prospect of decelerating at two gravities or a bit more for several thousand years.

"All this is aside from the fact that, at our present distance from Earth, there is nothing known that will help us find our way back.

"I'll leave these thoughts with you. I'm going to grope my way down to Compton—our last hope!"

THERE was blazing light in the engine room—a string of gasoline lamps shed the blue-white intensity of their glare onto several score men. Half of the men were taking turns, a dozen at a time, in the simple task of straining at a giant wheel whose shaft disappeared at one end into the bank of monstrous drive tubes. At the other end the wheel was attached to a useless electric motor.

The wheel moved so sluggishly before the combined strength of the workers that Harcourt thought, appalled: "Good heavens, at that rate, it'll take a day—and we've got forty minutes at utmost."

He saw that the other men were putting together a steam engine from parts ripped out of great packing cases. He felt better. The engine would take the place of the electric motor and—

"It'll take half an hour!" roared a bull-like voice to one side of him. As he turned, Compton bellowed: "And don't waste time telling me any stories about running into stars. I've been listening in to you fellows on this wall communicator."

Harcourt was conscious of a start of surprise as he saw that the chief engineer was lying on the steel floor, his head propped on a curving metal projection. His heavy face looked strangely white, and when he spoke it was from clenched teeth:

"Couldn't spare anyone to send you up some light. We've got a single, straightforward job down here: to stop those drivers." He finished ironically: "When we've done that we'll have about fifteen minutes to figure out what good it will do us."

The mighty man winced as he finished speaking. For the first time Harcourt saw the bandage on his right hand. He said sharply:

"You're hurt!"

"Remind me," replied Compton grimly, "when we get back to Earth to sock the departmental genius who put an electric lock on the door of the emergency room. I don't know how long it took to chisel into it, but my finger got lost somewhere in the shuffle."

"It's all right," he added swiftly. "I've just now taken a 'local.' It'll start working in half a minute and we can talk."

HARCOURT NODDED stiffly. He knew the fantastic courage and endurance that trained men could show. He said casually:

"How would you like some tech-

nicians, mathematicians and other such to come down here and relieve your men? There's a whole corridor full of them out there."

"Nope!" Compton shook his leonine head. Color was coming into his cheeks, and his voice had a clearer, less strained note as he continued: "These war horses of mine are experts. Just imagine a biologist taking a three-minute shift at putting that steam engine together. Or heaving at that big wheel without ever having been trained to synchronize his muscles to the art of pushing in unity with other men."

"But forget about that. We've got a practical problem ahead of us; and before we die I'd like to know what we should have done and could have done. Suppose we get the steam engine running in time—which is not certain; that's why I put those men on the wheel even before we had light. Anyway, suppose we do, where would we be?"

"Acceleration would stop!" said Harcourt. "But our speed would be constant at something over thirty light years per second."

"That's too hard to strike a sun!" Compton spoke seriously, eyes half closed. He looked up: "Or is it?"

"What do you mean?"

"Simply this: this sun is about twelve hundred thousand miles in diameter. If it were at all gaseous in structure, we could be through so fast its heat would never touch us."

"Gunther says the star is somewhat colder than our own. That suggests greater density."

"In that case"—Compton was almost cheerful—"at our speed, and with the hard steel of our ship, we could conceivably pass through a steel plate a couple of million miles in thickness. It's a problem in fire power for a couple of ex-military men."

"I'll leave the problem for your old age," Harcourt said. "Your attitude suggests that you see no solutions to the situation presented by the star."

Compton stared at him for a moment, unsmiling; then: "O.K., chief, I'll cut out the kidding. You're right about the star. It took us fifty hours to get up to two hundred forty thousand miles per second. Then we crossed some invisible line, and for the past few hours we've been plumping along at, as you say, thirty miles a second.

"All right, then, say fifty-three hours that it took us to get here. Even if we eliminate that horrible idea you spawned, about it taking us thousands of years to decelerate, there still remains the certainty that—with the best of luck, that is—with simply a reversal of the conditions that brought us here, it would require not less than fifty-three hours to stop.

"Figure it out for yourself. We might as well play marbles."

THEY CALLED Gunther and O'Day. "And bring some liquor down!" Compton roared through the communicator.

"Wait!" Harcourt prevented him from breaking the connection. He spoke quietly: "Is that you, Gunther?"

"Yep!" the navigation officer responded.

"The star's still dead on?"

"Deader!" said the ungrammatical Gunther.

Harcourt hesitated; this was the biggest decision he had ever faced in his ten violent years as a commander of a spaceship. His face was stiff as he said finally, huskily:

"All right, then, come down here, but don't tell anyone else what's up. They could take it—but what's the

use? Come to Compton's office."

He saw that the chief engineer was staring at him strangely. Compton said at last: "So we really give up the ship?"

Harcourt gazed back at him coldly: "Remember, I'm only the co-ordinator around here. I'm supposed to know something of everything—but when experts tell me there's no hope, barring miracles, naturally I refuse to run around like an animal with a blind will to live.

"Your men are slaving to get the steam engine running; two pounds of U-235 are doing their bit to heat up the steam boiler. When it's all ready, we'll do what we can. Is that clear?"

Compton grinned, but there was silence between them until the two other men arrived. O'Day greeted them gloomily:

"There's a couple of good friends of mine up there whom I'd like to have here now. But what the hell! Let 'em die in peace, says Harcourt; and right he is."

Gunther poured the dark, glowing liquid, and Harcourt watched the glasses tilt, finally raised his own. He wondered if the others found the stuff as smooth and tasteless as he did. He lowered his glass and said softly:

"Atomic power! So this is the end of man's first interstellar flight. There'll be others, of course, and the law of averages will protect them from running into suns; and they'll get their steam engines going, and their drives reversed; and if this process *does* reverse itself, then within a given time they'll stop—and then they'll be where we thought we were: facing the problem of finding their way back to Earth. It looks to me as if man is stymied by the sheer vastness of the universe."

"Don't be such a damned pessimist!" said Compton, his face flushed from his second glass. "I'll wager they'll have the drivers of the third test ship reversed within ten minutes of crossing that light-speed deadline. That means they'll only be a few thousand light years from Earth. Taking it in little jumps like that, they'll never get lost."

HARCOURT saw O'Day look up from his glass; the physicist's lips parted—and Harcourt allowed his own words to remain unspoken. O'Day said soberly:

"I'm thinkin' we've been puttin' too much blame on speed and speed alone in this thing. Sure 'n' there's no magic about the speed of light. I didn't ever see that before, but it's there plain now. The speed of light depends on the properties of light, and that goes for electricity and radio and all those related waves.

"Let's be keepin' that in mind. Light and such react on space, and are held down by nothin' but their own limitations. And there's only one new thing we've got that could've put us out here, beyond the speed of light; and that's—"

"Atomic energy!" It was Compton, his normally strong voice amazingly low and tense. "O'Day, you're a genius. Light lacks the energy attributes necessary to break the bonds that hold it leashed. But atomic energy—the reaction of atomic energy on the fabric of space itself—"

Gunther broke in eagerly: "There must be rigid laws. For decades men dreamed of atomic energy, and finally it came, differently than they expected. For centuries after the first spaceship roared crudely to the Moon, there has been the dream of the inertialess drive; and here, somewhat differently than we pictured it,

is that dream come alive."

There was brief silence. Then, once again before Harcourt could speak, there was an interruption. The door burst open—a man poked his head around the corner:

"Steam engine's ready! Shall we start her up?"

There was a gasp from every man in that room—except Harcourt. He leaped erect before the heavier Compton could more than shuffle his feet; he snapped:

"Sit down, Compton!"

His gray gaze flicked with flame-like intensity from face to face. His lean body was taut as stone as he said:

"No, the steam engine does not go on!"

He glanced steadily but swiftly at his wrist watch. He said:

"According to Gunther's calculations, we're still twenty minutes from the star. *During seventeen of those minutes* we're going to sit here and prepare a logical plan for using the forces we have available."

Turning to the mechanic, he finished quietly: "Tell the boys to relax, Blake."

THE MEN were staring at him; and it was odd to notice that each of the three had become abnormally stiff in posture, their eyes narrowed to pin points, hands clenched, cheeks pale. It was not as if they had not been tense a minute before. But now—

By comparison, their condition then seemed as if it could have been nothing less than easygoing resignation.

For a long moment the silence in the cosy little room, with its library, its chairs and shining oak desk and metal cabinets, was complete. Finally Compton laughed, a curt, tense, humorless laugh that showed

the enormousness of the strain he was under. Even Harcourt jumped at that hard, ugly, explosive jolt of laughter.

"You false alarm!" said Compton. "So you gave up the ship, eh?"

"My problem," Harcourt said coolly, "was this: We needed original thinking. And *new* ideas are never born under ultimate strain. In the last twenty minutes, when we seemed to have given up, your minds actually relaxed to a very great extent.

"*And the idea came!* It may be worthless, but it's what we've got to work on. There's no time to look further.

"And now, with O'Day's idea, we're back to the strain of hope. I need hardly tell you that, once an idea exists, trained men can develop it immeasurably faster under pressure."

Once more his gaze flicked from face to face. Color was coming back to their faces; they were recovering from the first tremendous shock. He finished swiftly:

"One more thing: You may have wondered why I didn't invite the others into this. Reason: twenty men only confuse an issue in twenty minutes. It's we four here, or death for all. Gunther, regardless of the time it will take, we must have recapitulation, a clarification—quick!"

Gunther began roughly: "All right. We crossed the point of light speed. Several things happened: our velocity jumped to a billion or so times that of light. Our electric system went on the blink—*there's* something to explain."

"Go on!" urged Harcourt. "*Twelve minutes left!*"

"Our new speed is due to the reaction of atomic energy on the fabric of space. This reaction did not begin till we had crossed the point of

light speed, indicating some connection, possibly a natural, restraining influence of the world of matter and energy as we knew it, on this vaster, potentially cataclysmic force."

"*Eleven minutes!*" said Harcourt coldly.

Greater streams of sweat were pouring down Gunther's dark face. He finished jerkily: "Apparently our acceleration continued at two gravities. Our problems are: to stop the ship immediately and to find our way back to Earth."

He slumped back in his chair like a man who has suddenly become deathly sick. Harcourt snapped:

"Compton, what happened to the electricity?"

"THE BATTERIES drained of power in about three minutes!" the big man rumbled hoarsely. "That happens to be approximately the theoretical minimum time, given an ultimate demand, and opposed only by the cable resistance. Somewhere it must have jumped to an easy conductor—but where did it go? Don't ask me!"

"I'm thinkin'," said O'Day, his voice strangely flat, "I'm thinkin' it went home."

"Wait!" The flat, steely twang of the word silenced both Harcourt and the astounded Compton. "Time for talkin' is over. Harcourt, you'll be enforcin' my orders."

"Give them!" barked the captain. His body felt like a cake of ice, his brain like a red-hot poker.

O'Day turned to Compton: "Now get this, you blasted engineer: Turn off them drivers *ninety-five percent!* One inch farther an' I'll blow your brains out!"

"How the devil am I going to know what the percent is?" Compton said freezingly. "Those are engines, not delicately adjusted labora-

—a hundred—and that was top speed for that wheel with that power to drive it.

The seconds fled like sleet before a driving wind. The engine puffed and labored, and clacked in joints that had not been sufficiently tightened during the rush job of putting it together. It was the only sound in that great domed room.

Harcourt glanced at his watch. Four minutes. He smiled bleakly. Actually, of course, Gunther's estimate might be out many minutes. Actually, any *second* could bring the intolerable pain of instantaneous, flaming death.

He made no attempt to pass on the knowledge of the time limit. Already he had driven these men to the danger point of human sanity. The violence of their rages a few minutes before were red-flare indicators of abnormal mental abysses ahead. There was nothing to do now but wait.

Beside him, O'Day snarled: "Compton—I'm warnin' ya."

"O. K.! O. K.!" Compton barked sulkily.

Almost pettishly, he pulled the clutch free—and the wheel stopped. There was no momentum. It just stopped.

"Keep jerkin' it in an' out now!" O'Day commanded. "'N' stop when I tell ya! The point of reaction must be close."

In, out; in, out. It was hard on the engine. The machine labored with a noisy, shuddering clamor. It was harder on the men. They stood like figures of stone. Harcourt glanced stiffly at his watch.

Two minutes!

In, out; in, out; in—went the clutch, rhythmically now. Somewhere there was a point where atomic energy would cease to create a full tension in space, but there

would still be connection. That much of O'Day's words were clear. And—

ABRUPTLY the ship staggered, as if it had been struck. It was not a physical blow, for they were not sent reeling off their feet. But Harcourt, who knew the effect of titanic energies, waited for the first shock of inconceivable heat to sear at him. Instead—

"Now!" came the shrill beat of O'Day's voice.

Out jerked the clutch in its rhythmical backward and forward movement. The great space liner poised for the space of a heartbeat. The thought came to Harcourt:

"Good heavens, we can't have stopped completely. There must be momentum!"

In went that rhythmically manipulated clutch. The ship reeled; and Compton turned. His eyes were glassy, his face twisted with sudden pain.

"Huh!" he said. "What did you say, O'Day? I bumped my finger and—"

"You be-damned idiot!" O'Day almost whispered. "You—"

His words twisted queerly into meaningless sounds. And, for Harcourt, a strange blur settled over the scene. He had the fantastic impression that Compton had returned to his automatic manipulation of the clutch; and, insanely, the wheel and the steam engine had reversed.

A period of almost blank confusion passed; and then, incredibly, he was walking backward into Compton's office, leading an unsteady, backward-walking O'Day. Suddenly there was Compton, Gunther, O'Day and himself sitting around the desk; and senseless words chattered from their lips.

They lifted glasses to their

months; and, horribly, the liquor flowed from their lips and filled the glasses.

Then he was walking backward again; and there was Compton lying on the engine-room floor, nursing his shattered finger—and then he was back in the dark navigation room, peering through a telescope eyepiece at a remote star.

The jumble of voice sounds came again and again through the blur—finally he lay asleep in bed.

Asleep? Some part of his brain was awake, untouched by this incredible reversal of physical and mental actions. And as he lay there, slow thoughts came to that aloof, watchful part of his mind.

The electricity had, of course, gone home. Literally. And so were they going home. Just how far the madness would carry on, whether it would end at the point of light speed, only time would tell. And obviously, when flights like this were everyday occurrences, passengers and crew would spend the entire journey in bed.

Everything reversed. Atomic energy had created an initial tension in space, and somehow space demanded an inexorable recompense. Action and reaction were equal and opposite. Something was transmitted, and then an exact balance was made. O'Day had quite evidently thought that at the point of change, of reaction, an artificial stability could be created, enabling the ship

to remain indefinitely at its remote destination and—

BLACKNESS surged over his thought. He opened his eyes with a start. Somewhere in the back of his brain was a conviction of something wrong. He couldn't quite place the discordant factor, but it quivered there on the verge of his brain, an alien thing that shattered for him the security of the spaceship.

He strained his senses against the blackness—and abruptly grew aware of the intensity of that dark. That was it! The darkness! The indirect night light must have gone off.

Odd that the light system should have gone on the blink on this first "night" of this first trip of the first spaceship powered by the new, stupendous atomic drive.

Footsteps whispered hesitantly along the corridor. There was a knock, and the voice of Gunther came, strained and muffled. The man entered; and his breathing was a thick, satisfying sound that destroyed the last vestige of the hard silence. Gunther said:

"Harcourt, the damndest thing has happened. It started when everything electrical went out of order. Compton says we've been accelerating for two hours now at Heaven only knows what rate."

For the multi-billionth time, as it had for uncountable years, the incapable cosmic farce began to rewind, like a film—held over!

THE END.



TREPIDATION

By R. S. Richardson

An article on trepidation in the astronomical sense—on the inequalities of time. There is now reason to believe that some of science-fiction's wilder guesses may be literal fact!

Illustrated by F. Kramer

Trepidation, n. 1. A vibratory oscillation; a trembling, especially, an involuntary trembling often due to fear, nervousness, excitement. 2. Hence, a state of terror, alarm, or trembling agitation; fright; as to be in great *trepidation*.

Webster's New International Dictionary.

SUCH is the meaning of the word as ordinarily used, its meaning as applied to people. But it also has another little-known connotation used to describe a certain rare phenomenon in our Solar System. The modern scientific definition might read somewhat as follows:

"Trepidation (astron.). A mysterious surge or wave of unknown origin affecting the Earth and possibly other planets. Generally appears as an abrupt and inexplicable change in the astronomical time scale."

Trepidation has been clearly recognized only within the last decade, although the data upon which it is based extend over two centuries. Out of these thousands of observations there has gradually emerged a result so strange, so contradictory to scientific experience that it seems more like the wild delusion of a paranoiac rather than the product of cold mathematical analysis. Yet many of the foremost names in theoretical astronomy may be found in the literature of trepidation. Lever-

rier was probably the first to suspect it, his intuition for the unseen carrying him beyond the figures in his tables. Simon Newcomb discussed the effect at considerable length, but refused to credit its reality to the end. Not until the twentieth century did E. W. Brown of Yale University and William de Sitter of the Observatory at Leiden demonstrate the existence of trepidation beyond all reasonable doubt. Today the question is not so much, "Is it real?" but instead, "How can such things be?"

"When you hear the tone the time will be one eleven and one half."

The tone sounds, and having sounded, we set our watch and move on about our business. It never occurs to us to challenge the young lady's statement or ask what kind of time she is talking about. How the telephone company keeps its clocks regulated interests us not at all. We have a hazy notion that it all starts back at the Naval Observatory in Washington, D. C., where the astronomers get the time very accurately from the stars. The nation has the most implicit faith in the reliability of these men. There is a nice comfortable feeling in the thought that here is one thing in the world we will never have to worry over.

It is a little disquieting, therefore,



to learn that recently sudden fluctuations have been discovered in the length of the day far larger than can be explained by the action of any known forces. The rotation of the Earth was originally selected as a measure of time principally because it was practically impossible to conceive of an appreciable variation in its motion. The astronomer has come to rely upon his apparent star positions absolutely.

He watches a fast-moving equatorial star as it steadily progresses over the illuminated field of his transit instrument, automatically recording its passage across the meridian to a hundredth of a second. There is a relentless finality about that moving speck of light that is terrifying to contemplate, something awe-inspiring in the knowledge that no power on Earth can stop it, or cause it to deviate from its path by so much as a hairbreadth. Time and tide, death and taxation, are as fickle as the wind by comparison.

No wonder that any difference between the time of meridian passage of a star and the time shown by the clock is always attributed to an error in the clock. That the mechanism controlling the clock should be right and the rotation of the Earth at fault is unthinkable.

Time thus derived from the rota-

tion of the Earth as shown by the apparent motion of the stars might be given the name of astronomical time (A. T.). It is the basis for the time that governs our daily life, from which it is easily derived.

BUT THERE IS another kind of time just beginning to be recognized that is more fundamental even than time determined from the stars. It has been called by several names, the most common being Newtonian, or Universal Time (U. T.). The concept of Universal Time is hard to grasp. It may be thought of as that quantity in the formulas describing the motions of the planets that can take any value—the so-called “independent” variable of the mathematician. An astronomer calculating the position of Venus for the epoch 1787.248 is using Universal Time. The lecturer in a planetarium running the sky back to the birth of Christ is using Universal Time, although he doesn’t know it. It is a time stream that flows on entirely free from time as determined from the length of a planet’s day.

The difference between A. T. and U. T. is generally of the order of a fraction of a minute, and for almost all purposes, no distinction is necessary between the two. The significant fact is not the size of the dif-

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ference, but the fact that there is any difference at all.

The necessity for being so painfully precise can be blamed directly on to the Moon. It may come as something of a shock even to the astronomer to hear that in certain respects the Moon would make a better timepiece than the stars. The stars move smoothly and majestically across the heavens in parallel circles, and aside from minute variations that can be allowed for, remain fixed with respect to one another. The Moon, on the contrary, seems to be all over the place. But it is this very fact of its rapid motion that makes it such a good chronometer, just as the second hand of a watch gives the time more closely than the hour hand.

Also, the Moon is one of the most thoroughly observed bodies in the Solar System, a careful watch having been kept on its whereabouts since 1750. This long accumulation of lunar positions provides a check on every force disturbing its orbit, some thousand terms being needed to take them all into account. E. W. Brown, who devoted most of his life to the job, once remarked that keeping track of the Moon was like "playing chess in three dimensions blindfolded."

YET after each tiny perturbation has been computed and its effect properly applied, the Moon still refuses to follow the orbit prescribed for it. If we determine where the Moon should have been at the time of some ancient eclipse, we find that it was considerably off schedule according to the records, and the farther back we go the worse the discrepancy becomes. This is largely due to the slowing down of the Earth's rotation by tidal friction, chiefly by water in shallow seas such as Bering and the Irish Seas. At present it is prolonging the day by

one-thousandth of a second per century. So long as we measure time solely by the Earth's rotation we are powerless to detect it. Not until bodies exterior to the Earth begin to get seriously out of step in the march of time do we come to suspect that something is wrong.

Much more startling than the feeble drag of the tides are the sudden irregular jerks in the Moon's motion of enormous magnitude, compared with known disturbing forces. They can be explained equally well by upsets in the motion of the Moon or in the rotation of the Earth. The question can be decided by finding whether other bodies besides the Moon show similar fluctuations, for if the effect is caused by the Earth's rotation, then it should appear in the motion of every planet, being largest for the fastest-moving planets, but identical in time for all.

The best material for the test are the transits of Mercury over the Sun, most of which have been well observed since 1667. It is interesting to note that speedy little Mercury has the somewhat doubtful honor of being more valuable to science as a geometrical point than as a physical body. It was in this role that Mercury helped furnish one of the proofs of the Einstein theory, and now he is drafted again to serve as the locus of a point of space. Several other criteria are also available, such as the orbital motion of the Earth, Venus, and Mars—transits of Venus are too rare to be of service here—and eclipses of Jupiter's satellites.

After many elaborate and painfully technical discussions of these data, the results are finally in and admit of but one conclusion: *some powerful and unknown agency is at work in the Solar System which acts suddenly to create abrupt changes*

in the motion of the planets. According to Brown, it is as if a mighty wave or surge were spreading throughout interplanetary space. It was to this phenomenon that the eminent chronologist, the late Dr. Fotheringham, applied the name of trepidation.

THE FIRST ONE came in 1790 and was rather gradual, owing perhaps to uncertainties in the observations. But the other two in 1897 and 1917 were sharp and well-marked. In 1790 A. T., as shown by the Moon and Mercury, was thirty-four seconds behind U. T. Then A. T. began to gain on U. T., until by 1863 the two were equal, and in 1897 A. T. had gotten thirty-six seconds ahead of U. T. In that year *something* happened. The trend suddenly changed, and A. T. began to lose at the prohibitive rate of nearly a second per year. Twenty years later the same *something* again appeared, and A. T. has been steadily gaining with respect to U. T. ever since.

If we assume trepidation to be the result of alterations in the Earth's rotation, then we must be prepared to explain how these originate. But no forces can be imagined that could begin to alter the day by the amounts the observations demand. The frictional effect of the tides is insignificant compared with the energy at work in trepidation.

Are there surface changes due to meteorological action that might be effective? Several have been suggested that are fairly plausible qualitatively, but fail miserably as to quantity. De Sitter has calculated that if the Himalayas were removed to the pole, about one fourth of the trepidation of 1897 would be produced. Accumulation of ice and snow at the poles has been brought

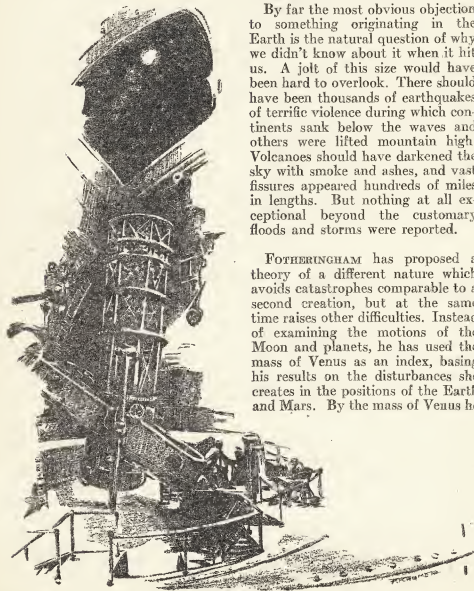
forward, but in order to be adequate, enough water would have to be frozen to lower the average sea level by one foot. Brown took the trouble to examine the hydrographic records around 1897, but found nothing unusual.

Failing to find the necessary energy outside the Earth or upon it,

geophysicists have been driven to dig inside of it for clues. The only possibility here is a pulsation similar to that supposed to account for the variation in light of certain stars, but much smaller in amount. An expansion of the entire Earth of only a few inches would be sufficient to account for the changes, but no such vibration has ever been observed.

By far the most obvious objection to something originating in the Earth is the natural question of why we didn't know about it when it hit us. A jolt of this size would have been hard to overlook. There should have been thousands of earthquakes of terrific violence during which continents sank below the waves and others were lifted mountain high. Volcanoes should have darkened the sky with smoke and ashes, and vast fissures appeared hundreds of miles in lengths. But nothing at all exceptional beyond the customary floods and storms were reported.

FOTHERINGHAM has proposed a theory of a different nature which avoids catastrophes comparable to a second creation, but at the same time raises other difficulties. Instead of examining the motions of the Moon and planets, he has used the mass of Venus as an index, basing his results on the disturbances she creates in the positions of the Earth and Mars. By the mass of Venus he



does not refer exactly to the quantity of matter in the planet, but rather to its mass considered as a perturbing force on other bodies. He obtained the remarkable result that the mass of Venus fluctuates in phase with the fluctuations shown by the Moon and the transits of Mercury. It seems impossible to believe, however, that the mass of Venus can in any way depend upon the rotation of the Earth. Hence he argues we are forced to conclude that the fluctuations in the mass of Venus are real. But we only know the mass of Venus relative to the Sun; there is no means of deciding which is actually changing.

Fotheringham thinks it is probable that all the planets fluctuate in mass, the effect being only shown in Venus because no other planet's mass can be measured in the same way. This movement, or trepidation, as he calls it, is in the nature of a vast wave spreading outward from the Sun to all the planets. Possibly as the Solar System journeys through space it may pass through regions where time and space are warped, causing slight deviations from Newtonian motion, just as a fleet of ships sailing abreast in still water would be thrown out of line on encountering a whirlpool.

Other hypotheses equally speculative have been advanced, but the cause of trepidation remains as mysterious as ever. Regardless of whether it is caused by changes in the Earth's rotation or in the motion of the planets, there can be no doubt of the reality of the effect itself. Perhaps the next time it comes its true meaning will be revealed, in what form we can only guess. This may be sooner than we think. Professor Brown, in a report to the Smithsonian Institution in 1937, shortly before his death, revealed

that "the deviation of the Earth from showing correct time is now greater than it has ever been since observations were made with sufficient accuracy, and consequently it is reasonable to suppose that a new change may soon occur."

At the last transit of Mercury, on November 11, 1940, the planet surprised astronomers by coming upon the Sun's disk a half minute ahead of the predicted time given by the Naval Observatory. The exact cause cannot be stated until the positions of the Sun and Mercury are carefully checked, but Mercury was certainly out of its calculated orbit.

In the meantime we can only await whatever may be in store for our little family of planets—with trepidation!

THE END.

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BIRD WALK

By P. Schuyler Miller

A very small bird can be a very deadly enemy—and very dangerous weapon for one who knows its ways!

Illustrated by M. Isip

COMMANDER JEFF NORCROSS was humped over his workbench with his long, sensitive nose deep in a tangle of tubes and wires when the door of the radio shack popped open, admitting a blast of steaming air and the reek of overripe Gorgonzola. With a yelp he flung himself forward over his apparatus, but a moment later the smell of cheese became overpowering and something landed heavily on his back and began to poke around between his ear and his elbow with a rubbery beak.

With a mighty heave of his shoulders, Norcross sent the creature spinning and came up with his chair in both hands.

"Hall!" he bellowed. "Get that triple-damned gulper out of here before I break its back! Get it out!"

The bird stood just out of his reach, contemplating him with a thoughtful expression on its bright, purple face. It was as big as a turkey, with the slightly sinister expression of a cockeyed goose. Its head and neck were bare and purple; its wingless body was a powder puff of magenta down; its legs were two feet long, with blue ruffles to the toes; and it had a long, curling red tail like a rooster and a bright yellow beak like a curlew. It smelled to high heaven of cheese.

Norcross poked at it gingerly with his chair. The birds were spry and

they had nasty tempers. A clatter behind him brought him around with a howl of anguish. A second gulper was standing up to its knees in the wreckage of the radio, twisting off bits of copper and gulping them down as fast as it could gobble. As he turned, the first bird bounced past him and into the feast. Norcross hit the roof.

They were going round and round the shack like a six-day bicycle race when Dave Hall finally heard the racket and came to investigate. One of the gulpers was ahead, squealing bloody murder in a canary soprano, its long neck stretched out, its cerise wattles flapping, its pantaletted legs pumping for dear life. A length of copper wire was trailing from the corner of its bill, and it was trying desperately to swallow as it ran.

Jeff Norcross was right behind, his splintered chair leg making vicious swipes, and behind him came the second gulper, its spine feathers on edge with indignation, murder in its popeyes, whooping like a hoarse Comanche and clacking its beak hopefully.

Hall watched them through the door port while they made two rounds, then opened the door a crack and snagged the second gulper as the parade came by. He held it by the neck at arm's length, with its stubby claws swinging wickedly a



The tiny thing was a flash of color across the clearing, too swift for human eye to follow—

couple of inches from his vest, went over to the rain barrel, scooped off the scum of yellow algae, and

dunked it. The bird snapped at him disconsolately and stalked off, dripping color, just as Norcross and the

other gulper emerged from the shack and took themselves off down the path toward the park gate.

DAVE was methodically assembling the remains of the radio when Norcross returned. The older man had blood in his eye and a six-inch patch out of the back of his coat where the irate gulper had landed on him. He stood in the door for a moment, opening and shutting his mouth, then slammed the remains of the chair leg down and flung himself into a chair. It collapsed.

"Borers," Hall pointed out helpfully. "Birds'd clean 'em out if you'd let 'em. What happened to the radio?"

"What happened?" The commander's blood pressure was on the upgrade, but he was struggling dauntlessly to keep cool and calm. "You stand there and watch those birds of yours eat my copper and you ask *me* what's wrong? You stand there with that beautiful piece of apparatus busted to 'smash and you want to know what's *wrong*? Omi-gawd! When will they send me a man who can use the brains they stuffed him with?"

"How'd they get in?" Hall wanted to know.

"You let 'em in, you poisoned pup!" The patrolman's beetling black brows were bristling, and his little mustache was on end with rage. "Time after time I ask you to keep your birds out of this shack. I beg you. I *order* you. You can have 'em anywhere else. You can bring 'em into mess and feed 'em out of my plate. You can let 'em roost in my bunk and lay eggs in my dress jacket. But you *can't* have 'em in here! I mean it! I'm through! This one goes on the wire!"

The grin slid off Dave Hall's bland young face. The easy-going

Norcross had perhaps made his first assignment in the space patrol easier than most commanders would have done, and he had a certain taste in practical jokes himself outside the line of duty, but a black mark in the post report was a black mark for life. This was serious.

"Look, sir," he said earnestly. "You're wrong about that. I mean this time. I was in barracks when I heard you eall. Maybe the door was ajar or something."

Norcross eyed him suspiciously. The rookie was no liar. "O. K.," he snapped. "Maybe it was. Maybe it wasn't. I heard the latch click when it opened. There's something ratty going on around here, anyway. That radio didn't just up and die. Some lug's been monkeying with it—sending personal calls to his floozies in Laxa, like as not. Break out the emergency kit—we've got to build us a new one."

THE SPACE-PATROL post at the edge of the huge Venusian forest preserve never rated more than a two-man garrison unless there was trouble brewing. The patrol was there for window dressing, to represent the triplanet council and give an official air to what went on in the name of conservation and science. The rangers who patrolled the preserve itself and acted as guides for tourists were paid by the Venus government. They didn't like the patrol, and the patrol didn't like them. Chances were, Dave thought, that the chief was right. Some ranger had sneaked in to use the powerful transmitter for a private call and bollixed up the works. Then he'd let the gulpers in to cover up for him.

"Who's on the gate?" he inquired. Norcross glared at him. "Spin-

ney!" he snorted. "May his guts bloat! I've had enough of him, too. You're going to print this whole shack, inside and out, and if I find that he's been in here *he'll* go on the wire in six languages!"

Hall nodded. Of all the rangers—some of whom, he admitted off the record, were pretty nice guys—Spinney was the most obnoxious. To begin with, he was somebody's nephew and he used his pull to the limit. He was sleek and natty at all times, in a climate that would distill the lard out of soapstone, and he had the telltale pallor that proved he took bleach baths to remove the nasty sunburn he picked up on duty. He was patronizing and officious, and it was the dearest hope of every patrolman who was ever stationed at the park that Captain Hector Spinney would get lost in the woods and be eaten by mice. Only he never went near the woods. He did a little office work to keep his hand in, and when his appraiser's eye spotted a neat bit of gluteal arc in a party of tourists he would occasionally come down off his throne and give them the privilege of his personal attention on a tour of the tamer portions of the preserve.

Unfortunately, Spinney had been in the radio shack with full authority any number of times in the past, and his fingerprints were probably all over the place. The patrol radio was the official medium of communication for all governmental agencies in the park area, and there wasn't a member of the staff who hadn't been in the shack at some time. Hall pointed this out. He got no reply, but he didn't expect one. Norcross was not one to enforce unreasonable demands. He began quietly to assemble the missing parts which would be needed to restore the radio.

AST—3

PRESENTLY Norcross had cooled down enough to be human. "What you been doing?" he asked. "Chasing birds again? Whyn't you leave that kind of spap to the rangers?"

By grace of somewhat phony feathers, eggs, wings, and a few other similarities, Venus had birds just as it had fishes, lizards, and men. Evolution on Venus and Earth, directed by a limited number of usable combinations of certain vital chemicals, had taken parallel courses in parallel environments. Biologists were not even ready to swear that hybrids between the flora and fauna of the two planets might not be possible with a little test-tube diddling. Stranger things had happened.

Dave Hall's hobby back on Earth had been birds, and he had brought it with him to Venus. He reveled in the rather startling new varieties of feathered life that swarmed in the jungle sanctuary. The *kru*, the half-amphibian natives of Venus, had never seen any need for boats, and had consequently never discovered the island on which the preserve was located. The first zoologist to see it had howled loudly until it was proclaimed a national park, and now it was one of the show spots of the planet.

"Yep." Dave had only half heard his superior's question. Then it penetrated. "Say—yes! I was out all morning. And I found me a king-teller!"

"Yeah?" Norcross ignored such birds as he did not violently dislike. "What about it?"

"It's new here," Dave explained. "It isn't even in the official lists for the park. Fact is, they're rare anywhere. The *kru* had an idea that they were spies for their headmen—you know the old gag about 'a little bird told me.' Well, the *kru* had a story that these royal tits—that's

the book name for 'em—were informers, and the first Earth settlers picked it up. I guess there were plenty of uneasy consciences in the old days, because they just about wiped the species out. The natives and jungle rats still got them on the sly. They're scared stiff of 'em."

"That so?" Norcross seemed interested. "A new one, huh—that Spinney and his pretty boys couldn't find? Keep it up, kid. Good thing to have a hobby. Keeps a man from going space-happy if he gets a single detail or goes on garrison with a guy whose guts he hates. That's how I got started on radio. I was alone for fifteen months on an asteroid the time I worked out the hep-tad circuit."

Hall beamed happily. Jeff Norcross had quite a reputation in the patrol, both as an inventor and as a man. "Ornithology isn't such a hot hobby for a patrolman, I guess," he admitted. "You don't find many birds in space. But I like to study 'em when I get the chance. I located a brush hen this morning, too. They're related to the gulpers, you know: when a hen's setting she'll swallow anything you offer her and hold it in her crop until the eggs are hatched. I'm going to feed her Spinney's badge some day."

Norcross had repaired the damage to the radio and was intent on the settings. Reception had been bad enough in the past ten days, thanks to sunspots and the general atmospheric cussedness of the planet, before the set blanked out. He sent out the station's call signal and filed his routine report, then as headquarters came in he stiffened in his chair. He waved his hand wildly for the pencil that Hall slipped into his fingers and began to scribble like mad. All the recruit heard of the conversation were his "Yes, sir," "Yes, sir,"

"We'll do that, sir." Then he snapped the shut-off switch and sat back.

"The Gem's gone," he said flatly.

DAVE HALL gaped. The Gem was the peculiarly colored star ruby, the size of a hen's egg, that one of the first explorers had found in the possession of the *kru*. At the time of the first revolt, when the settlers pulled away from Earth and set up their own empire under a crafty ex-congressman from Kansas, it had become the symbol of royal authority over the entire planet. Since the return of democratic government under the council, it had been in the Laxa Museum under heavy guard. Twice in the past generation it had been stolen and used as the symbol of revolution, and twice the patrol had brought it back and squashed the spark of revolt.

"When?" he demanded. "How'd it happen?"

Norcross frowned. "This was a slick job," he said thoughtfully. "No violence—nobody killed—but some very smart individual with ideas of his own got it—and he's on his way here."

Dave came up on his toes with a click. "Here?"

The commander nodded. "They are sure of that. They've been trying to raise us since about the time the set broke down. Somebody needed the guards with some fancy dope that stopped time for them for about ten minutes. In that ten minutes someone in a museum guide's uniform cut out the alarm, opened the case with a key, took the Gem, substituted a fake, and got out. They didn't spot it until the check-up when the guard changed. But the only people in the place who had left when the alarm was given were a party of tourists—and

they're on their way here."

"Gee!" Hall's boyish face wrinkled in thought. "What'll we do? Search 'em?"

Norcross shook his head. "We're not in this yet," he said glumly. "The Venus Council wants to keep it hushed up for fear that the news will start a lot of crackpots rioting. They won't call on the patrol till they find they're stuck, like last time. No—it's Spinney's baby. It was in the orders he got this morning before the set went bad. Funny he didn't say anything about it. Hell—it isn't that big a secret!"

Dave had been thinking. "Look, chief," he said, "even if it isn't our job now, we can't afford to miss anything. If they've narrowed it down to one party—and I'll bet a button it was the patrol that spotted them this quick—they must be pretty sure that the thief still has the Gem on him. If he has, there's a reason why he's with this particular tour. There are dozens of tourist parties in the museum every day, but they don't all come here afterward. Unless he's hiding the Gem on the boat coming over, that means he's going to leave it here. It'd be easy to cache it somewhere on the nature tour and come back for it later, or pass word to an accomplice. I'm going around with 'em and keep my eyes open."

Norcross stared at him. He had been thinking just that himself. "Go to it," he agreed. "You haven't got long. There's the boat—and here comes Spinney."

The head ranger was as tall as Dave Hall, and nearly as broad. His gray-green uniform was flawless, and his spiky mustache waxed to a needle point. He thrust open the door and stood on the threshold, one knee cocked forward jauntily.

"Ah!" he exclaimed. "Radio going again? Then you've heard the

news. This is *my* job, Mr. Norcross. When I want the patrol I'll send for it. Suppose you both stay right here where I can find you. I am guiding this party myself, and no one will be allowed on the preserve without my permission. Understood?"

The two patrolmen glared at the closing door. Dave Hall let out his temper in a long hiss. "Chief," he declared tautly, "that stinker is in this. He knew about the radio. He's warned us off the preserve. He's in it!"

He strode to the window and looked after the retreating ranger. Spinney was standing on the terrace in front of the barracks, watching the tourist launch swing in to the landing. Dave's eyes narrowed. He turned to his superior. "If it please the captain," he snapped, "I have urgent personal business which requires my immediate attention. I am not on watch until six o'clock. Have I the captain's leave?"

Norcross bristled. "What do you mean? Any of your nonsense and we'll be on the grids. Use your head!"

"Yes, sir. This is personal business. I will not wear the uniform of the patrol. Have I leave, sir? I . . . I expect to study birds."

A little spark gleamed in the older man's eyes. The boy had stuff in him, and they'd taken Spinney's leaveings for a long time. "You have my leave," he said gruffly.

THE RANGER was halfway down the leafy tunnel that led to the park gate when he heard Hall's racing footsteps behind him. He turned with a frown just as a man-sized fist came up and caught him neatly on the jaw. His knees V'd out and he dove into the bushes.

Still wriggling the ranger's uni-

form into position on his somewhat oversize shoulders, Dave Hall stood at the gate watching the tourists come up the steps from the boat. The whole thing now depended on the two rangers with them, Chase and Williams. If his hunch was good, Spinney had not told them about the ruby. They liked the head ranger no more than he did, and they might—they just might—string along.

There were six visitors, and any one of them might be the man he wanted—or the woman. One couple looked like second honeymooners: a white-haired old gentleman with a military goatee and an army backbone, and a little old lady clinging to his arm. It might be a gag—the whole party might be in this together—but Hall had a hunch it was a lone-wolf affair. Probably the thief was a Venusian—or in the pay of someone with royalist aspirations.

The man next to the old couple looked like a politician or a grocery magnate. He had on a spotty white suit, an elaborately tapestried tie, and a huge diamond ring. It was a good front if it wasn't genuine. Then he saw the girl and his eyes narrowed.

In two centuries, climate and diet had done certain things to the men and women of Earth who had come to live on Venus. Although there had been no mixture with the *kru*, white Venusians had become more and more like the little natives. There was a yellowish cast to their skin, and their hair had a bluish tinge in the right light. Their complexions were smoother and creamier than other people's, particularly the women's. Their lips were fuller and darker red, and their eyes had queer coppery flecks in the iris.

This girl was tall, and she had long legs—longer than most native

Venusians'. She was burned a deep brown—a most peculiar brown, Dave thought, almost golden underneath. She wore dark glasses, although at this season of the year the sun rarely broke through, and her hair had been dyed. Of that he was sure. It was a silky ash-blond, but her eyebrows were dark—and as the light struck them they were blue! She had Venusian blood!

He stalked to meet them with an exaggerated imitation of Spinney's strut. The other rangers must be certain that this was a practical joke or the whole thing would be off. He studied the other tourists: a short, stout woman with gray hair and heavy shoes, who by no stretch of the imagination could ever have posed as a museum guide, and a soft-looking, heavy-set man in a trick hat who seemed to be sticking close to the girl. Dave decided that his lips were too full and red, his face too white, and his clothes too perfectly up to the minute.

He saw Chase's mouth beginning to open and a puzzled look growing on Williams' freckled face. He stiffened, clicked his heels and gave a flourishing salute.

"Chief Ranger Hall, ladies and gentlemen," he proclaimed. "At your service! Captain Spinney's compliments, and he is regrettably detained by official business. He has delegated me to conduct you on a specially arranged tour of the preserve, which will include some parts not generally opened to the public. May I have the honor?"

TOM CHASE's wide mouth had shut, but there was a suspicion of a grin of it. He introduced them: Colonel and Mrs. Porter, the old couple, on a diamond-wedding tour; Professor Vedder, of Yale, the "politician"; James, the heavy-set man

who was wearing purple glasses and skin-tight gloves; Miss Anderson, the stout schoolteacherish female. He kept the girl for the last, and Dave knew he did it deliberately. She was a Miss Wandreau of New York, and Dave cursed under his breath as he tried to place the name. New York was his home town, and he knew every pedigree in the social register, but he couldn't place a Wandreau. And yet the girl was familiar—he'd seen her before, somewhere. The trouble was that somewhere was a pretty big place.

She had a fragrance that made his head swim. Her voice did things to the little hairs along his spine. "Shall we see Captain Spinney before we leave?" she inquired. "I hoped to meet him. I've heard so much about him from mutual friends."

"Yes!" It was the spotty-looking professor. "I've written him. There are things we must discuss. Can't we see him before we begin the tour?"

Dave was ticking over half-submerged recollections in his head at a furious rate. "Professor Vedder," he said, "don't you teach ornithology at Yale? I'm sure I was in one of your classes."

The little man clawed out a pair of pince-nez and balanced them on his nose. He tipped his head back and looked Dave up and down. "Hall? Hall? I don't remember you. I don't remember any Hall in the service? Who are you? How long have you been here?"

Williams—good old Goose-boy Williams, who always had a couple of gulpers tagging him, snapping at the brass eyelets of his boots—came to the rescue. "Ranger Hall was recently promoted and transferred here, sir," he volunteered. "He has

a way with birds. He's like a father to them."

That was a dirty crack, having to do with a clutch of gulper eggs which Dave had smuggled out of the park for omelette and smuggled back again as chicks, with Williams' help, when they hatched in his duffel bag. He let it pass.

"I made a discovery only this morning which I am sure will interest you all," he announced. "I recorded the Venusian royal tit for the first time within the limits of the park."

He was looking straight at the girl as he spoke. For a moment her eyes flashed behind her dark glasses, but her only reply was a smile. The professor rose to the bait. "Indeed! Miss Anderson—Colonel Porter—this will be a rare treat! You remember the legend I was telling you on the boat—the story of the king-teller. Shall we see it?"

They should. Dave was most anxious to oblige. He watched their backs as they preceded him through the gate. The teacher and the little professor were out, except as accomplices. They were too short and stout to have worn a guide's uniform. Porter—evidently a retired military man—was tall enough and had a deep spaceburn that would hide the telltale Venusian yellow in his skin. His hair was white, and Venusians rarely changed with age, but it might be bleached. James was plenty big enough, and so, to his satisfaction, was the girl.

DAVE HALL was in his element. He knew the park better than many of the rangers, to begin with. He shepherded his little flock through all the usual trails, keeping an eagle eye on their every move and patterning away at the usual guide-book marvels. He was nearly caught out

on botany, but the teacher, Miss Anderson, turned out to be a vociferous and opinionated amateur in the field, who was willing and anxious to argue fine points with the professor. The others dutifully looked and listened and were led on their way.

He gave them a good time, by his standards. After all, they might all be innocent, and some of them certainly were. None of them had tried to pull anything as yet, and he doubted that anyone would until he called the signals.

He led them down-wind on a colony of gulpers and let them throw pennies to the ravenous birds, whose insatiable craving for copper in any form was a standing mystery in scientific circles. He showed them the tiny tufted dipper, no longer than a man's thumb, whose single membranous egg is laid in the cup of a certain huge fungus, where it soaks up dew and rain water and swells to three or four times the size of the parent bird before the heat of the sun begins to incubate it. He showed them a female jug bird, neatly walled up in a kind of clay jar by her mate, her head sticking out of the narrow neck, while her eggs hatched. He showed them the little golden bee birds, with transparent membranous wings like great feathered insects, that nest in great colonies in waxy cells, and the gaudy green-and-white stone-picker that builds itself a nest of colored pebbles cemented together with its gluey saliva. He showed them all the park's usual wonders, with variations, and then he lined them up and made his spiel.

"Folks," he told them expansively, "we've come to know each other pretty well on this little tour of ours. Ordinarily we would be turning back at this point, but Captain Spinney

arranged a little something extra for the special benefit of those of you whom he has—met—before. He was to have conducted you himself, but Commander Norcross of the space-patrol post here received certain news which made an immediate conference necessary. I have the captain's full confidence, and while our further tour may to some extent transcend the regulations, I am sure you will understand and appreciate the captain's interest in your entertainment. Miss Wandreau—this section of the sanctuary may be rather hard on white shoes. May I apologize in advance?"

She smiled. "You've been very entertaining so far, Mr. Hall. I'm sure we are all looking forward to your further revelations."

"We'd hardly want to miss what Spinney planned for us." That was James. The man was nervous, and he hadn't enjoyed a brief brush with a harmless flying reptile which Dave had captured and fed to a banded bell bird. The others were equally voluble, so with a grin of appreciation Dave led the way into the underbrush.

IT WAS late spring, and the trail, even shaded as it was by some of the densest jungle on the preserve, was dry enough to walk on. Otherwise he would never have persuaded them to try it. He let Miss Anderson and the professor discover new plants and beautifully repulsive fungi for themselves, and concentrated his attentions on the others.

The brush hen was the first move in his game, and he was somehow pleased to see that the girl spotted it first. It was James, however, who pointed it out. They had been studying a tiny mouselike creature which Dave had found for Mrs. Porter, clinging to the underside of a

leaf, when James spotted a glint in the bird's eye. "What's that?" he whispered.

Dave chuckled. "Recognize it, professor?" He bent over what looked like a splotch of dried blood on the forest floor. The brush hen cocked a bright yellow eye up at him, opened a ducklike beak lined with bright scarlet, pointed it skyward, and howled.

He gathered the bird up under one arm and let the women pet it while it nibbled at his buttons and made hopeful stabs at the girl's jet earrings. "It's a brush hen," he told them. "Professor Vedder will tell you that it belongs to the same genus as the gulgurs you saw earlier. When the female is brooding, as this one is, she will swallow anything you cram down her gullet." He fingered the bird's distended crop. "Feel here—she must have gobbled down half a dozen small stones."

A thrill ran up his spine as the girl's fingers touched his. He felt her eyes on him, behind the impenetrable disks of her glasses, and his own eyes hardened as he spotted the telltale wash of blue at the roots of her hair.

The brush hen made a grab at Colonel Porter's fob and nearly had it. Laughing, Dave set the bird back on its nest, where it promptly began to howl again.

"It'll shut up when we leave," he told the others. "The male is probably somewhere out there in the brush, waiting for us to go. If you miss anything when we get back to the post, you'll probably find it in this bird's crop. Captain Spinney or I will get it for you. We're the only ones who know where the nest is."

He let them stroke the bird and feed it pebbles and coins while he talked with the professor. A small

warblerlike bird flitted across the trail, lit on a vine and burst into a deep bass solo before vanishing into a knothole. He used it as an excuse to move away from the brush hen, and he noticed with satisfaction that Miss Wandreau, James, and the Porters lagged behind and had to hurry to catch up. Everything was happening right on schedule and according to specifications.

They had seen the furred mouse-bird that nests under stones, and heard the distant halloo of a saffron guide bird—the first, incidentally, on his own list. He explained how the bird's human-seeming call had led many a lost hunter or explorer into difficulties, and gave them a look at the morass in which it nested.

The guide bird gave him another out for a problem which had been worrying him. Spinney couldn't stay tied up forever, and when he was found the pursuit would be on. He might be able to pass off the shouts of the posse as bird calls—given a lot of luck. None of these people were fools.

THE FOREST was quite open here, and the party had spread out. James and the girl were a little way ahead, and the Porters were lagging behind, while Dave compared notes with Miss Anderson and the professor. Then the girl screamed.

In a flash Dave was beside her. It was as though the forest had opened at her feet. A huge flat creature squatted there in a shallow pit, its warty back tufted with lichens and evil-colored fungi, its flat skull plastered with shreds of decayed wood. Its narrow, yellow eyes glared up at them, and a slender scarlet tongue had licked out and wound about her ankle.

Dave felt the girl trembling under his fingers. He bent close to her ear.

"Steady!" he murmured. "Let's give them a show."

Ever so slowly he crouched down beside her; then, with a lightning snatch, had the monster by the tongue. Instantly it unwound from the girl's ankle and coiled around his wrist. James, who had been standing petrified a few feet away, leaped back to safety, but the girl stood still, looking down at him.

"Every Venusian baby is scared good with one of these things," he told her. "It's quite harmless, unless you happen to be a small animal or a ground-nesting bird, but you can't convince a native-born Venusian of that. They think its touch means death. They'll swear its breath is deadly, and that it can paralyze you with one glance of its eyes and swallow you alive. It's the bunk! Look!"

He reached out, caught the creature by one foreleg, and heaved it over on its back. It lay there, hissing and kicking, until he tickled its sulphur-yellow belly, and then it began to bubble like a great teakettle. The girl smiled, took an uncertain step forward and went down in a heap.

Several minutes passed before she was herself again. Dave Hall's brain was in a whirl. The weight of her slim body in his arms as he picked her up—the perfume of her hair—everything about her told him that it couldn't be so, but it was. It must be! Skin—hair—complexion—they all checked. Unless he was wrong from the start, the thief had Venusian blood, and there was no one else who fitted. He had to be right!

"I'm sorry this happened," he told them apologetically. "The jungle is always unpredictable. If that creature had been dangerous, Miss Wandreau might have been dead before

Mr. James or I could reach her. Luckily it wasn't—except to someone who believes the native stories."

Their backs were up; he could see that. The women had taken charge of the girl, and James had picked up her purse and gloves. "I've had quite enough of this exhibitionism, and I'm sure the others have, too," he snapped. "If you're through with your little surprises, perhaps you will take us to Captain Spinney."

"He'll hear of this!" It was Porter. "If you had been attending to your duties as a guide, this would never have happened. Take us back at once!"

Hall was a bit pale. He'd muffed things. "Professor—Miss Anderson! I can show you the king-teller in a very few minutes, and the opportunity may never come again. There's really no danger."

"Certainly not!" Colonel Porter was ramrod stiff with indignation. "There is something very peculiar in all this. I am thoroughly acquainted with the service which you claim to represent, and it would never tolerate the familiarity and impudence which you have shown. That uniform was never made for you. Take us to Captain Spinney at once!"

It was Mrs. Porter who turned the tide. "Come, George," she said, taking her husband's arm. "Don't be an old ninny. We've come all this way and we've had a very good time, and we certainly don't want to go home without seeing the rarest bird of all. I'm sure Miss Wandreau agrees."

The girl's smile looked a bit wan, Dave thought, but she nodded. When he led the way he was by himself. James and the colonel had constituted themselves her bodyguard, and he saw that the fancy boy still had her gloves.

HALL RUBBED IN the story of the king-teller as they walked. He told one version of the story and encouraged the professor to amplify it. He egged Miss Anderson on to ask questions and answered them in detail. And all the time it seemed that he could feel three pairs of eyes boring into his back, searching his mind. The thief was on his guard now, and anything could happen.

"Mr. Hall," the teacher demanded, "is there anything in this legend? Can a bird really detect treason?"

He shrugged. "Venusians believe it," he replied, "and they should know. It's not only the *kru*, though they had the story first; every native-born Venusian I ever met had been brought up on the same yarn. It's not impossible, you know."

"Rubbish!" Colonel Porter bristled with hostility. "I've been on every habitable planet in the System—did it before you were born—and these native superstitions are poppycock. Nonsense! Damned ignorant natives start 'em and a lot of ignorant nobodies keep 'em going. Eh, professor?"

The professor looked uncomfortable. "You are both right," he said lamely. "It is possible that a certain race, or people with certain habits of life, may have an imperceptible but characteristic odor which is attractive to these birds. It is also quite possible that under the influence of superstitious or guilty fear this odor will change and infuriate the bird so that it will attack the terror-stricken person. It is well known that dogs and some insects will smell and attack fear in a human being. Why not a bird? And yet—I cannot bring myself to believe it."

"I cau." The girl's voice was very

low. Her hand was on James' arm, and the man's full lips were twisted in a sneer as he watched the others. "I had a Venusian nurse—a woman whose ancestors came from Earth with the first explorers, and who had been a child among the *kru*. She was homesick for Venus, and she told me many of its legends. She was an intelligent woman, and an educated one, and she believed."

They had come to the clearing where Dave had found the bird that morning. The place was ablaze with flowers, and he suspected that the king-teller's nest was somewhere nearby. Suddenly he saw it, a scarlet dot darting among the gaudy blossoms of a pepper cup. He felt the professor's fingers on his arm, and heard Miss Anderson gasp. The tiny bird seemed to be working in their direction. Looking over his shoulder, he saw that the others had stopped at the edge of the clearing.

"There was another story your nurse may have told you," he said softly. "Certain men in the king's service could call the king-teller and summon it to smell out treason. These men understood the bird's language and could talk to it. They were the ones to whom it reported. This is how it was done!"

PURSING his lips, Hall whistled—a high, trembling shriek, more like the squeak of a mouse than a bird's call. Instantly the tiny bird paused in its flight. It hung in midair, a scarlet mote, and as he squeaked again it darted toward him and hovered a foot from his face, seeming to stare into his eyes. He gave a new note, a shrilling twitter, and it twittered in reply. He turned.

"A certain thing was stolen from the museum in Laxa," he said. "A royal thing, whose theft was treason. The thief was a Venusian, and he is

here. He is one of you. O bird—*which is he?*”

He whistled again, that same low, tremulous, shrilling twitter. He stepped back slowly, his fingers sliding down to the gun at his belt. The bird was facing the little semicircle of people, and their eyes were fixed on it. Dave tried to read those eyes—the professor’s, little and wary; Colonel Porter’s, hard and bright; Mrs. Porter’s, dark with trouble; the teacher’s, round with amazement; and James’ and the girl’s, hidden behind their dark glasses.

Like a dart of fire the king-teller moved. It hovered before Miss Anderson; it hung for a moment over the professor; then, like a glowing spark, it drifted toward the Porters. Dave’s hand closed on his gun, but it had passed them. A shot crashed, and another. The bird wavered; then, with a whistle of fury, it hurled itself at James, who stood with a gun in his hand and his teeth showing between his full red lips. He turned to run; then the bird’s long needle beak struck him full in the temple. He went down, with the body of the bird pinned like a bright-feathered dart to his skull.

Close by came an answering shot. A moment later Norcross crashed through the bushes, followed by Chase and Williams.

“What’s happening here?” the commander demanded.

“Where’s Spinney?” Dave asked.

Norcross snorted. “Where he’ll keep! When Williams found him he was raging, out to get your pelt and nail it on his door. Then I mentioned that you’d found a king-teller, and Chase said that you were going to show it to this gang. First thing we knew he poked a gun in our guts and I had to slug him. Then we came looking for you.”

“There’s your thief,” Dave told him. “James. He had me fooled with that skin bleach and dyed hair. His lips and eyes would have given him away, but he wore glasses. Even so I should have tumbled, but I had my own candidate. I was too sure. Well—the king-teller knew the truth.”

THE GIRL laughed softly. “Was I your candidate, Chief Ranger Hall?” She had taken off her glasses, and there were no specks of any kind in her eyes. They were blue—just the clear, cool, transparent blue of the open sea that Dave Hall hadn’t seen for ten long years. “The Dave Hall I knew, years and years ago on the rocks at Ogunquit, is in the space patrol—not the rangers.”

“Toni! Toni Bevis! Oh, *was* I an ape! But what’s that fancy name—and what happened to your hair? It was black when you were twelve.” A terrible suspicion overcame him. “It is *Miss* Wandreau?”

She laughed. How could he ever have forgotten that laugh? “It is. Mother married again. But how could one of the supermen of the space patrol possibly fail to recognize the product of a New York beauty expert?” She touched her golden cheek. “Venusian bronze—done under special lamps. I’m all like that.” She puckered up her lips. “Venusian Kiss—the very latest shade. It’s said to be irresistible.” She ran her fingers through her hair. “This is *really* new—Venusian blue. Ladies of fashion in New York look more like Venusians than the real thing now, *Patrolman* Hall.”

Norcross had been kneeling by the dead man. “O. K.!” he barked. “So you’re bosom pals. Now where’s the Gem. It’s not on him.”

Dave blushed. “Maybe I did go

all haywire, but that part of it's all right," he said. "I figured that I was either to take the thing from whoever had it, or signal him where to hide it. Nobody made any move to slip me anything, so I told them how very palsy I was with Spinney, and how he'd planned the next act specially for them, and then took 'em over to see a brush hen. You'll find the Gem in the bird's crop any time you want to look for it. Tom Chase knows where the nest is—he showed it to me this morning."

He looked sheepishly down at his feet, stuffed into Spinney's too-small boots and punishing him violently for the sacrilege. "I have a confession to make," he said. "That moss-back was a put-up job, too. I sort of held the rest of you back so Toni—Miss Wandreau—would be the one to blunder into it, and when I galloped to the rescue like the rangers are always supposed to do, I doused her hair with a little moonflower juice. I knew that would attract the king-teller, and I figured if she was really a Venusian she'd break. It was a pure fluke that James went off his boiler and tried to kill it. That's bad stuff. Those birds won't take it. You saw yourself what happened."

He knelt down and gently pulled the tiny bird's bill out of the wound it had made in James' temple. The sharp beak had been driven clean through the thin bone. The king-teller lay in his palm, a little fluff of rumpled red and black feathers. "Maybe the prof would like this for his collection, if it isn't needed as evidence," he said.

Miss Anderson was yanking violently at his elbow. "Look!" she cried. "Look! I saw it breathe! It's only stunned."

As she spoke, the bird stirred. It tucked its tiny feet under it and wobbled along until it could grasp his finger. Suddenly it was in the air, a buzzing, squeaking mite of fury, swinging round and round their heads in ever-narrowing circles. Dave went white. The moonflower in Toni's hair!

It hung before her like a scarlet bubble, and she stared back into its beady eyes. It swam closer on blurring wings, until it was touching her hair with its beak. Then it was gone, so swiftly that none of them saw it go. They glimpsed it for a moment among the flowers, then it rose in a mounting spiral and vanished over the treetops.

Hall shivered. "I guess maybe you've had enough of birds for a while, folks," he said. "I've put you all to a lot of trouble, and I'd like to make up for it. Won't you be our guests—the chief's and mine—for dinner before you go?"

Norcross looked sourly from him to the girl. "Sure," he said. "We'd like to have you. It's sort of monotonous out here by ourselves all the time. It just happens that Patrolman Hall is cook tonight, so you can be sure of a good meal." He grinned evilly at Dave. "I'm sure Chase and Williams will be glad to amuse Miss Wandreau while you're washing the dishes. And another thing. Those pet gulpers of yours found your uniform where you left it after you slugged Spinney. They ate all the brass buttons. Maybe if you can make 'em cough 'em up and scrub the cheese off 'em, one of the ladies will sew 'em on again for you while you're peeling the potatoes."

He jerked a thumb over his shoulder. "Get going—kitchen cop!"

THE HOMEMADE GUN OF JAMRUD

Nor quite ten years ago four British artillery officers of the Colonial Force, stationed near Peshawar in the northwest frontier province which separates Afghanistan from the Punjab, received an invitation to inspect a gun that had been manufactured—to be taken literally: made by hand—by the blacksmith of Jamrud, a Pundjabi from Campbellpore.

He had worked for ten months in his open shack and the workmanship of the gun was nothing short of excellent. The "machine tool" used had been an ancient lathe, driven by a one-cylinder kerosene motor that would itself be an exhibit for any museum maintaining a department for the history of engineering. The factory was an open shack, the tools were ancient and poor, the material was secondhand—but the craftsman was a craftsman. His gun had a caliber of 2.75 inches, obviously modeled after the 2.75-inch mountain gun of the British Colonial Force.

But it was the barrel of the gun that really caught the interest of the visitors. It had been fashioned from a locomotive axle, and since the lathe apparently could not handle pieces of such huge size—the entire barrel was sixty-seven inches long—it had been made in two parts, joined together by means of a locking ring with interrupted threads. It was, however, neatly rifled on the inside, with twenty grooves and one full turn for thirty calibers of length. The breech differed much from that of the mountain gun that had served as a model, either because the blacksmith had never had a chance to inspect such a breech closely or else because the work had proved too difficult for him, although the latter seems hard to believe. He had developed a design of his own, working with spring and firing pin, and influenced in its arrangement by the design of an automobile valve.

The charge consisted of one pound of black powder; an old cartridge case had been pressed into service as a firing tube, reloaded after each shot. The firing chamber of the gun was seven and one-half inches long, just the right size to accommodate that cartridge. The projectiles were shaped like artillery shells, they were seven inches long and weighed seven pounds, but they were solid cast iron. The blacksmith had built a primitive cupola furnace in which to melt iron scraps, and poured the projectiles into sand forms. After cooling, they were machined on the same lathe that had made the gun, and were grooved so that a copper driving band could be hammered on.

The gun was pulled into an alleyway between two houses and aimed across valley and village at a heap of white stones, about a thousand yards away. The first projectile produced a cloud of dust five yards to the right of the target. The native gunner bit his lips, reloaded the cartridge and the gun in turn and aimed very carefully. And the second shot actually was a clean hit. The natives did not trouble to conceal their pride, and they talked about their achievements at length during the voluminous breakfast that followed the "maneuver."

The British officers were somewhat at a loss as to what to think and what to say about the whole thing. The boast of the natives that a real 2.75-inch mountain gun would have needed at least six rounds to score a direct hit on the target was probably justified.

Willy Ley.



THE MUTINEERS

By Kurt von Rachen

The Kilkenny Cats—even supplied with transport by Gailbraith's efforts—still wanted to destroy themselves!

Illustrated by Schneeman

STEVE GAILBRAITH lifted himself from his bed and listened intently, laggardly reacting to the sound of

breaking glass somewhere in the old royal battleship *Fury*.

He was not quite certain that he

had heard anything for he had been deep in a musing doze. Nothing else reached his ears. The obsolete bulk of the *Fury* was throbbing through the bottomless ink of Canis Major, just as she had for the past three days. Several minutes later an air lock sucked itself shut with a swoosh and a clang and Steve lay back. The watch had probably jettisoned the corpse of another "green fever" victim belatedly dead. Scurrying footsteps brought Steve upright again, for they seemed to be approaching his cabin. They did not stop but sped on up the companionway at the end of the passage.

Steve got up and looked out. For several seconds he stood listening, but a draft was swirling about his bare legs and he again crawled into his bunk, ill at ease.

Minutes dragged by, but nothing further remarked the *Fury's* burrowing through space and Steve relapsed into his doze. Past events, he told himself, had made him unreasonably jumpy.

The series of sounds had interrupted his review of the past hours for their turbulence and end had left him doubtful as to any success in parleying with these fools.

The ingratitude of the lot of them and the swiftly worn away thanks for his deliverance of the expedition from slow slaughter, did not rankle upon Steve. Four years ago he might have brooded, but four years ago he had been a different being. Colonel Steve Gailbraith, politically radical deserter from the Royal Air Corps, had nearly broken under the short shrift given him by the men for whom he had victoriously fought. Once through with the need of him, Fagar, Dictator of All, had repaid him, not with medals but with trial and membership in the Sereon Expedition. The People's Government,

it seemed, had no want of men bright enough to overthrow the leaders who had overthrown the throne. Steve Gailbraith had gone into the revolt with hundreds of his brother officers because they, too, had sickened of the Royal tyranny and the sight of a world starving in plenty. But they had not really known Fagar. They had not known what Fagar might do to those he thought dangerous to him, no matter how much they had helped him.

THE Sereon Expedition might better have been called the Suicide Expedition, for Sereon of Sirius had wiped out one colony already. Fagar and his new ministers were not stupid. Oh, no. Their ally, the Sons of Science, led by Jean Mauchard, might bring their disagreement with the people's party into a second revolt, for Jean Mauchard did not like to see the streets turned into a feeding trough for blow flies, did not like to see ten thousand aristocrats herded into a coal mine and left to their agony, while a people's band played loud enough to keep the moans and weeping of children from disturbing the slumber of their commissioner.

Jean Mauchard, high member of the scientific caste, had a scientist's thirst for truth and accuracy, regardless of the consequences. Jean Mauchard discovered Fagar's soul when he walked into the palace, unfortunately to witness the brutal torture of the Emperor of All and what Fagar did. Jean Mauchard expressed his horror and attempted to plead for the empress in the name of humanity and the glory of man. Fagar, slimy with the shovel's scum in a sixth level mine, had never heard of the glory of man.

Jean Mauchard had poured his sulphuric acid on Dave Blacker

when loud, unrepressed Dave Blacker had attempted to prove that the scientists had not at all aided the longshoremen in the northwest war.

Jean Mauchard hated anything which savored of the officer's caste for, as a scientist, Mauchard saw in them nothing but a force trained to destruction. Hence, Mauchard hated ex-Colonel Gailbraith and was even now jealous of Steve's feat in getting them off Sereon, getting them a ship, trying to keep peace.

Vicky Stalton was not the sort of woman a man with red blood and a heart could hate. The torch of liberty girl, who had waved the millions of sorely oppressed on through blood to victory, was the daughter of a nobleman, but he had never given her name. She had fought up from the gutter to a position as propagandist and had developed her talent too well. Jean Mauchard thought her a tricky liar at best and failed to credit her with strength and courage enough to blast Fagar after she discovered that she had been writing and crying lies.

Steve moved restlessly in his bed. The fools were saved. If they held a solid front now, they could be free of Fagar upon some far planet. Fagar would try to find them, would send some scouts of the old royal fleet after them at the very least, for they had defied him, Emperor of All! They had stolen the ship sent to finish them if their mutual hatreds had not. And if, at any time, they relaxed, they might again meet Fagar—and instant death. Fagar had not dared finish them off. Oh, no. He had glorified them and a program to push out the limits of Earth control, knowing all the time, as the public cheered them, that they went to a doom manufactured out of their own animosities.

The conference ended a few hours before had left Steve exhausted. It had made him apathetic with the realization that he was trying to save men who did not want to be saved but only to exert their own wild wills. Several hundred longshoremen, women, children, captive crew members, Mauchard's men, Vicky Stalton and Steve were at stake unless some agreement were reached. From past performance, one would have thought they would listen to Steve. They had not. They had cried him down as a traitor to his own corps, as a shifty rascal intent on saving his own boots and had swept away every plan he had offered.

Dave Blacker, blatant and stubborn, disliked the military, disliked scientists, propagandists, dictators—

STEVE BURROWED wearily into his thermobag, as though by doing so he could get rid of this problem and these people. He felt particularly low, for in the row about the ward-room table, he had unleashed his parade-ground voice, had hammered so that a pitcher of water had overturned. And unpredictable Vicky Stalton, dodging, had cried above his roar:

"What are we? A pack of Royalist soldiers? If you keep that up, you'll get bellow for bellow. Ye gods of Aramus! Is this a parley or a hog-calling contest?" And, flirting water from her ragged little uniform tunic, had stomped from the ward-room.

Later, he had knocked at her door and had said to a segment of her face, "I'm sorry."

"For trying to drown me?"

"Yes. With words and water."

"That's better."

In her tone he had understood that she had been righteously wait-

ing there, knowing he would come, certain of his apology—

"Only one thing," he had said, his annoyance stirred, for he was weary and heartsick with the stupidity of them, "the next time I'm having difficulty in trying to get a point over, I wish you wouldn't throw your weight on the other side."

"I did no such thing. You can't call me an ally of Blacker or that mule Mauchard!"

"I didn't call you an ally," he retorted. "But it's your neck as much as it is mine. I've got enough to fight without a dumb blonde stepping in—"

She slammed the door of her cabin and left him there afume. He was tired. He was irritable. It took him an hour or more to see that he had browbeaten her without cause.

Well, to hell with the lot of them. Mauchard wanted to head for a place he called New Terre which swung about Procyon in Orion. Mauchard claimed that a friend of his, a Royalist Scientimajor named Gabrille, had stated his intention of heading for that place in case the Royalists lost. Mauchard claimed that New Terre already had a small Earth population and that uranium ore, stadiatite, from which inertia was made, duo-iron ore and many other valuable minerals were there in abundance.

Mauchard had said that they could help the colony, attract other refugees to them and soon enter into trade with unconquered peoples on other planets and, in short, make themselves strong enough to defy Fagar.

With a longshoreman's distrust of mines—bred from the propaganda atrocities of the supervisors in sub-levels—Dave Blacker had taken the stand that Mauchard's crowd was trying to delegate the longshoreman

faction to the laboring side of it and enslave them by scientific trickery.

Steve had attempted to cross-question Mauchard on the scientist's knowledge of the place and gathered that Mauchard relied upon his friend Gabrille. Mauchard was right about the size and position and climate of New Terre, for all that was written at length in "Space Directions" as Mauchard proved. When Steve had countered with the doubt that such a valuable colony would remain unattacked when robbed of the protection of Earth in flames, and had added his belief that they might find anything from Garcons to Mirionites in possession, Mauchard had forsaken argument for scathing personalities.

STEVE TOSSED restlessly. They had settled nothing. They were roaring through the empty dark without destination, liable to any attack, unable to man the *Fury's* best defenses through lack of trained crews, ripped by discord and suspicion.

Damn women.

What ailed Vicky? It did not occur to him that Vicky, too, was under as great a strain as he. Some of the Royalist disdain for the new order and its freedom for women was still with Steve. He might lose his ideals, his faith in man, his lust for honor, but he could not quite adjust himself to the idea that a woman had a right in council equal to a man's. Therefore, he could not see that she, too, took some of this burden.

The intership phone was at hand. Several times he had wanted to take it down and talk to her, but he knew that she would probably wind it up into another argument, or that he would blast at her again.

He resigned himself to troubled pondering upon his own fate. There

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seemed to be but one point of ambition glowing in him and that was hardly one of which a former officer and gentleman might be proud. He wanted to see Fagar on his knees in the muck, digging his own grave with the shovel he had plied so long in the mines and then drop Fagar's beast-body into it with a blast from his own hand. There was so much raw, red satisfaction in envisioning that, that it almost frightened Steve.

Indeed, revolt did drag men down below the very animals which they reviled.

Steve sat up and reached for a cigarette out of the late Commisar Lars' own box. He watched it glow as it lighted itself, his mind on other things.

But there was something very strange about the way this cigarette glowed. Instead of a red coal at its tip it had a weird, green flame.



For Vicky, the mask had come too late. The gas had put her too deep for any hope of relief now—

Steve stood up, staring. He hauled half a dozen in a row from the box and each one glowed in a similarly ghastly fashion.

Was it poison?

Did Mauchard or Blacker or a member of the beaten battleship crew want him out of the way that badly?

There was a nerve-tingle in the thought. Like a whirl of turned leaves from a military text, all available information raced through his mind.

He had to be sure of this. He pulled a flame cartridge from the seargun on the wall and bit off the end. He heaped a few grains on the edge of the washstand and touched a burning cigarette to it.

The thermilian flared greenly.

Green, when it should have been brilliant crimson!

Steve swung open a locker and swept down a rack of masks. His expert glance sorted the right one and practiced fingers suctioned its three-inch diameter to his nostrils and mouth. He took his first breath since the thermilian had flared.

He had not noticed how groggy he had been until now when the lethargy sloped off. He flicked on the master lights of the navigator's telltale board in this, the senior navigator's old room. The gas gauges were registering one hundred and three. The spectrum analysis band, when the switch was thrown from outer to inner atmosphere, glowed with unmistakable lines. The place definitely contained morphogene, known to the sailors of the old navy as "Mrs. Molly's Dream Darling," because it was also used in a Venusian dive, run by that lady to roll the unwary spaceman.

It was sometimes used in case of mutiny, having its main outlet in the crew's quarters and the armories.

There was no vent at all in the officer's superdeck, so that Steve had gotten the little which had crept into his cabin via the ventilating systems. If he had been asleep, it would have taken him as it had already taken, beyond doubt, the rest of the crew and anyone in the lower decks. Or, had he been asleep with it for hours, days, perhaps weeks?

MOTIVE-ANALYSIS was not a course in which Plebe Gailbraith had shone, probably because it had coincided with a period when Steve had been writhing through his first spasm of puppy love with the school commandant's charming daughter. But it did not strain his meager memory of that subject to deduce that Blacker would not use it, for Blacker probably did not know of it and would prefer force. That left the captive officers of Fagar and Mauchard. But the officers of Fagar were under bomb-locks in the double-belly. And Mauchard would favor a minimum of brutality—hence, morphogene and not instant-killing G-984, known as Statue Stuff.

Mutiny!

Jean Mauchard had found a way to enforce his will with a minimum of argument.

Poor old *Fury*! Her bulkheads were stained with the still-dark blood of her Royalist officers. Her bridge deck was chipped by the spaceboots of men not fit to feed her barrels. Rusty and stinking with unrepaired abuse, disgraced by a flag of corruption in the service of Fagar and now a pirate without a flag, commanded by sick renegades in mufti, disgraced again by mutiny.

He felt kinship for this vessel, for, as a middy, he had proudly stood his watches aboard her, had seen an emperor praise her, had helped her

single-handed battle with an entire enemy fleet. He had known the tradition into which they had both been born and knew tradition now was dead.

He, too, felt degraded and unclean. The last letter he had received from his father, shortly after Steve's desertion to a cause he felt glorious and just, had predicted such an end for him:

"You who have brought the name of Gailbraith into contact with the filthy scum of mankind's lowest dregs, may suppose righteous justice to be your destiny. But know that, no matter how bad may have been the treatment of the people, justice can never be brought about by the breaking of word, by brute force, by the obliteration of a class. The way of revolt is only the way to the destruction of all those things for which our civilization has stood. Revolt is the debaser of man, for there be no excuse for rape and ravage until calm counsel has failed. If you have definitely chosen the way of your going, then know that force breeds force and death breeds only death and that your finish, no matter your 'victories,' cannot be otherwise than as you chose to live—with dishonor, with degradation, without friend or flag, unmourned and with your clay merged with the filth to which you allied yourself in life."

He had thrown the letter aside, marking it off to a man's belief in an outmoded system, a father's disappointment in a son. But he could not cast aside the memory. For as the years of battle had rolled forward, so had it come true. He had broken his pledge to his service and now no pledge given him was valid. And he hurtled through the empty black without flag or friend or destination, unless it be that of the executioner's arc chamber, unless he

died through Mauchard's clumsiness.

Again he saw Fagar, digging his own grave and dying, strangled in its muck. Mauchard sought to rob him of that.

A CHILLY RAGE slowly took hold of Steve Gailbraith. He despised his own predilection for fatalism. He was fettered by a background belief that he could do nothing about the environment's grip upon himself. He was fettered by circumstance, yes. But not chained to the extent that his destiny could be spelled out by thirteen men and a bitter old man, more vengeful than competent.

He took down a seargun and looked into it. He put on an old Royal spacecape he had found forgotten in this cabin and swung it over his pajamas.

As he climbed the spiral ladder to the superdeck, the guard, a young scientist named Smithton, started at the apparition of what he at first took to be a Royalist officer. But Smithton was not one of Blacker's bullies, and superstition had no part in his make-up. He swung a blastick at Steve and pushed a buzzer for Mauchard.

Steve moved into the bluish light of the bridge lock. He was alarmed when he saw his own face reflected in the glass wall, for his cheeks were sunken and his eyes so far recessed as to be reflected not at all.

Mauchard stepped into the lock and looked through the glass at Steve. He slipped a mask over his nose and opened the lock door. Steve strode over the dyke and entered the eyes of the ship. Two Sons of Science jumped up from the resultographs and covered him with small blasticks. Steve took off his mask.

"Step up the gas content of the

air below," ordered Mauchard. A third Son of Science hurried into an adjoining cubicle. "Well?" he said sharply to Steve, "how is it that you are about?"

"Maybe I didn't get as big a whiff of it in my cabin," said Steve. "But that isn't the point. What are you about?"

"But one is tired of arguing with fools, he has to act as his superior knowledge directs," said Mauchard. "Now you can either take this tablet here or walk back through the lock without your mask. I will not tolerate interference from you."

"Are you heading for New Terre?"

"We are almost to New Terre. When you awaken you will be safely landed."

"Then the rest of the ship has been out for ten days or more."

"Twelve."

"You gave no heed to my warning that there might be people unfriendly to humans at your New Terre. In four years of civil war anything might take place this far into space. Have you given a thought to that?"

"I have and I seriously question it."

"Have you given a thought to your responsibility for the lives of these hundreds of people in case that small chance exists? You may, even now, be streaking forward to certain destruction for all of us, either at the hands of an Earth fleet or a strange population. You can't fight with thirteen men!"

"You cannot talk away my resolution," said the gaunt leader of the Sons of Science. "I suppose you would rather take Blacker's counsel and turn pirate. I, sir, am no mur-

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derer and thief. I seek only peace and the enlightenment of mankind."

Steve gazed at Mauchard's cadaverous face for several seconds and read there the unswerving purpose. This man had a goal of quiet years of research so deeply planted in him that he would not turn aside for anything. There was no arguing here.

"I will not brook interference, sir," said Mauchard. "Either take this tablet or go back without your mask."

Steve threw his mask upon the floor and turned to the lock. He paused there a moment before he opened the inner door and looked at Mauchard as though seeking some way to convince this man of his risk to them all.

"I might be able to help if you ran into trouble," said Steve.

"I want none of your help," stated Mauchard.

THE THOUGHT of meeting the danger he had begun to sense and have no power to thwart it, was akin to illness. Steve went into the lock and closed the door. The outer door was opened for him by Smithton. Steve reeled as the morphogene engulfed him.

The young, masked scientist might have been grinning, though his mouth was hidden.

"If I were you," said Steve, "I would go back inside the bridge, regardless of orders."

Smithton's voice was muffled. "I want none of your advice."

"Nevertheless, only a fool would overlook any indicator to death. If I am awake and can stand here in this gas-soaked air, remember there might be others also immune." He said that with his temples going in and out like miniature accordions. He could not hold on very many seconds without showing the effect.

"There is no immunity. Go back to your cabin before you fall down

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and I have to carry you back."

"I have been hit with morphogene thirty times," said Steve. "A man can develop a tolerance even to arsenic." The floor seemed to be swaying now, ready to strike him in the face. "I am going below now and I'll be back with reinforcements. Others are awake aboard this space can."

He stepped to the top of the spiral ladder, his back to Smithton. It was difficult for him to keep his mind on what he was to do, what he had figured Smithton would do.

Smithton did it. He snatched out and caught Steve by the shoulder, his blastick directed another way for the instant.

Steve whipped a hand behind him. As though impelled by some magic catapult, though only by his own helping shift of weight, Smithton somersaulted over Steve's head, sailed down to strike the rail and be turned by its curve while still in flight. Smithton struck heavily at the bottom and lay still.

That much activity almost cost Steve the last of his wits: He gripped the hand rail and fumbled and fell down the ladder. He felt Smithton under him but could not see, for the gas had taken toll of his sight. Steve felt weightless. His arms were jelly. His fingers that fumbled for Smithton's mask carried back but faint sense messages.

With the last of his consciousness, Steve clamped the mask upon his own mouth and nose and then sagged sleepily down, gulping in the purified air.

The knowledge that they might see them from above, brought Steve around more swiftly than his body liked. He crawled down the passageway to his cabin and summoned up enough strength to heave Smithton

to the bunk. He covered the young Son of Science with the Royalist cape.

MOMENT BY MOMENT, Steve was coming around. Anxiously he crouched down over the navigator's telltale board and threw on its lights. Touching a button which sent a billion cubes of light-years blurring under the glass, he saw the three-dimensional charts slow, go by, halt and then creep back. Two metal arms, worked by heavy calculating machines, slid rustily across the table and converged above the space chart. A third, which was a polarized shaft of light, stabbed up from below, through the chart. The first two arms quivered and warped so that they sagged into the cubicle chart. A brilliant spot of light gleamed in three space—their position at the moment according to the master calculators on the bridge. Another button depressed and the chart was blown up a hundred thousand times in size, its former limits pushing outward and vanishing in the frame.

Steve fluttered the leaves of "Space Pilot" and located the data relating to New Terre of Procyon. Taking its constant and feeding it into the space body plotter, he read it off and comparing it to the main chart, identified it as the sphere nearest to them dead ahead. It was plain then that not more than four hours were left of their journey.

What waited for them on New Terre? If it was as rich as Mauchard maintained, then certainly it would be held down by either Fagar or some horde of mysterious space. With the exhaustion of fuels throughout the Inner Empire, at least an armed geological scouting party would be encountered. Mauchard's friend Gabrille might have

been speaking idly when he thought of it as a future refuge. Of course, if *Gabrille* was on New Terre of Procyon, then all would be well—for Mauchard and his crowd. Blacker and his longshoremen, though this point had not much sympathy from Steve, would be reduced to something only slightly better than slavery and Vicky and Steve would find themselves complete outcasts, with no way to establish position and, hence, life. Whatever happened, everybody but Mauchard and his Sons of Science would lose.

Even now, her super decelerators were throbbing.

Speculating swiftly, Steve sought an out. Any out. But he alone could do so little and the rest of the ship was gripped in enforced slumber—

Blam!

The *Fury* shuddered from barrels to dust armor.

Blang!

She rolled like a strychnined dog.

From her upper turrets came a weak chatter of disintegrators. Their recoil accelerated the ship, lifting Steve back from the navigator's tell-tale. They had passed the area of bombardment and were turning.

An abrupt silence swept through the battleship, achingly unfamiliar after days and days of continuous barrel discharge either from bow or tail. A minute or more of this and a weak sputter of stern barrel igniters was heard, mounting into a shrill, useless whine. This was followed by a sharp, stabbing crackle of secondary arc ignition and the sob of emergency liquid gas pumps. And then, again, dull silence.

STEVE PUSHED through the passageway to Vicky's cabin. He kicked in the lock and sent the door

splintering back.

Vicky lay huddled in a thermobag, her small face pale as a dead man's, her straw-colored hair lying out over her pillow. So much did she look like death that Steve's heart lunged within him. He snatched down the rack of masks and found a right one which he fitted over her mouth and nose. He took a cloth and soaked it in water, placing it against her face. When she did not stir, he anxiously felt her pulse but could not discover any throb of blood. He shook her brutally.

"Wake up! Vicky. Wake up!"

He battered through the medicine cabinet and brought out an ancient remedy, ammonia. He broke the tube and held it close under her chin.

And still she did not move.

There was no lowering or rising of her breast, no flutter of eyelids, no beat of a heart to greet his anxiously listening ear.

"VICKY!"

Ashes were in his throat and acid in his eyes. His hands trembled as he shook her anew.

She was the color of a corpse.

Beautiful, jaunty Vicky. Vicky and her wisecracks, her disdainful smile.

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"Vicky—"

He let her down to her pillow and drew the cover across her face. He was too stunned to move, but stood touching her fingers which lay still

visible, bone-white upon the dark-blue bed.

BLANG!

BLANG! BLAM! BLANG!

Acid in his eyes and ashes in his throat. He picked himself from the scarred metal deck and steadied himself against the passageway wall.

BAM!

Again the *Fury* trembled and leaped sideways under the impact of bursting hell. Holding to the rail Steve crept down the ladder to the mid-deck. All but the ghastly blue emergency lights were off now and by their awesome gleam, he found Dave Blacker's cabin.

DAVE BLACKER was lying on the floor, tangled in his gigantically checkered topcoat, his round, hard hat tumbling back and forth as the *Fury* lurched, its tumbling speaking

of a new gravitational field. Blacker's knotty hands were still clenched to the chair by which he had attempted to pick himself up after the morphogene had taken him.

Steve kicked aside the G-231 mask Blacker had attempted to use and from the lockers of this, the first engineer's room, got out a morphogene disk. He clapped it on Blacker's face and then spilled a basin of water on the labor leader. The shock of it and the newly purified air made Blacker stir. Steve kicked him solidly in the shins and the pain brought Blacker into sitting posture, glaring about him as he gasped.

"Get up!" said Steve.

"What— Who the devil—"

"Get up!"

Blacker's glare intensified but he got up.

"The ship has been gassed. Mau-

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chard is on the bridge. Something has attacked us. Get that into your skull and get it there fast before we're all done in."

"My men! Where are my men?"

"They're knocked out and have been for twelve days. We're somewhere near New Terre of Procyon and our tubes are out of commission."

Blacker staggered under this load of information. "What . . . what are we going to do?"

Steve had never thought to have Blacker say that to him, ever. "Come with me and break out some of your men—the husky ones." He stepped to the engineering telltale and pushed the spectrum analysis button. The lines tallied with that of a cylinder which spun and stopped, spun uncertainly and swung to morphogene. The meters read sixty-two.

"Mauchard has cut off the gas. Come along."

Blacker lumbered after him into the crew's quarters. Men were sprawled here over a card game, there across food. Some who had been off watch were sleeping. A pile lay where the Sons of Science had dumped them inside the double doors. Children were sprawled where they had been at play and women in various attitudes over sewing or reading. Here and there, as the gas thinned and fresh air came in, people stirred groggily.

Up from aft came three Sons of Science, one of them holding a blood-soaked bandage to his face. These had been standing a tube watch with two others now lost. They saw Steve blocking their way and halted, looking dazedly at him with the lethargy of those who have looked over the brink into the gaping blackness of forever.

"What has happened aft?" said Steve.

"Gone. Roasted to hell!" said the

one with the wounded face. "Byre and Frankson—dead."

A longshoreman was trying to sit up. Steve hauled him from the bunk and shook him into awareness. Another pried himself from a card table and tried to straighten a stiff neck. Steve sent him spinning into Blacker's arms and his leader cuffed him awake. Six men were quickly recruited.

Steve said to Blacker, "There are two gun turrets on either side forward of the tubes. If you two," he turned to the scientists, "figure out the firing mechanism, I want you to stand by with your crews at either gun."

"I'll help," said the boy with the bleeding head.

"Come with me," said Steve.

"What am I supposed to do?" growled Blacker, hating to have to ask for orders, but lost in the sudden efficiency of defense.

"Rouse out your men," said Steve. "Hold them here until I see how things look."

"Is that all?" growled Blacker.

"You'll find some of the men of the old crew know their guns. Find those and man all batteries."

"All right," said Blacker glumly.

STEVE WENT AFT through the air-tight compartments until he came to one which refused to open. Beyond this, then, the ship was blown in.

He moved with swiftness, nervously as though if he stopped, some awful thing would catch up to him. Only his training made him act, for all that was capable of feeling in him seemed dead.

Later would come wrath. And Mauchard would pay for what he had done. But now came action.

Steve swarmed up the spidery ladders which led to the sixth observation post, an invisoglass turret

mounted on the battleship's back like a raindrop on an elephant. The vantage here was not as good as the meteor post above the barrels, but one glance around from it told Steve all he wanted to know.

The thick black engulfed the ship. But the *Fury's* hull was agleam with the rays of Procyon which appeared from here only slightly larger than faraway Sol himself, ten light-years and an almost invisible dot at Steve's back. The yellow-white brilliance of the gigantic Procyon made a hemisphere of softly hazed luminosity across the starboard sky. P-C.Mn.-313, otherwise and unimaginatively, New Terre, went from half to three-quarters, seeming to revolve slowly, as Steve watched it. He could see the seas upon it as burnished metal beneath the clouds; small seas they were, not connected but more like lakes. Shadows showed several low mountain ranges spreading apart to border the bodies of water. It was difficult to see color but one could imagine a dark greenness in the black splotches which were plains.

They were probably eight or nine thousand miles out from New Terre and its gravity was slowly sucking them down. Mauchard had obviously run in very close on his first approach, for try as he would, Steve could see no sign of hostile space cruisers.

Perhaps it had not been an attack at all. Perhaps the stern tubes, fed by inexperienced men, had blown—

He picked up the phone and was reassured by its crackling. He looked into the control bridge through it and saw Mauchard staring anxiously at New Terre.

"What happened?" demanded Steve.

Mauchard whirled and faced the intership screen. "Leave me alone!

I want none of your kind of help, Gailbraith."

"You're in no shape to want or unwanted," said Steve. "I've an affair to settle with you later. What happened?"

Mauchard glared stubbornly and then said, "Batteries about the city. We'll swoop within range again when we get around to the dark side. Our orbit is elliptical and all the steering mechanism is smashed." His voice broke. "Bow and stern tubes. Smashed! If they have guns like that, they'll have a fleet as well, waiting for us!"

Steve faced the phone to the coaming so he would not have to look at Mauchard. He had enough to think about without remembering—

They would crash into New Terre or, if Steve brought them off, float helpless in space, for they had no spaceboats to accommodate so many nor trained crews to man them. And if they landed with Garcons or God knew what strange race awaiting them—

Steve threw the phone switches and looked at the crew's quarters where Blacker was still hauling long-shoremen on their feet.

"Blacker! Get gunners from the crew and man all guns to starboard."

Blacker looked at the flashing panel. He must have had a glimpse of the nearness of New Terre for he quickly sent two men to rouse out crew members.

STEVE WATCHED New Terre go away from them and revolve, or appear to revolve, into its full light. They continued outward from it until it was again a hemisphere and during the next half hour, they swung with it still astarboard and began their swoop back on its dark side.

The phone whirled and lighted. It was Blacker, looking haggard in this, a strange situation. "All the guns that'll work are manned. Whadda I do now?"

"Fire the starboard guns at Procyon," said Steve.

"Hell, we wasn't attacked from that way. I heard a—"

"Do as I tell you," said Steve. "Or die and be damned to the lot of you!"

Blacker caught that commanding note in the teeth. He went forward to pass the word.

The phone whirled and Mauchard's starved face appeared. Mauchard's thin hair was awry and his dark, sunken eyes ablaze! "You are issuing orders! I intend to signal that we surrender. I did not tell them who we were. They may be an Earth colony and the fire a mistake!"

"If you want to ride a spaceboat, you can surrender that," said Steve. "You hate anything that smacks of war. You hate me as an officer trained to war. I served on this ship and, as long as you are aboard it and she is in danger, you'll serve me."

Mauchard, master of natural law and emperor of test tubes, could not be bettered in his realm. He was not in his realm. Not his courage but his knowledge had reached its limit. With his honesty of purpose and willfulness of ideals, Mauchard saw in ex-Colonel Gailbraith nothing but menace and treachery, the will to slay and beguile. And he would not surrender now—to Steve. But an answer became impossible as the *Fury's* starboard flame guns belowed into action, their searing shells swallowed by the brilliance of Procyon far behind them.

The *Fury* rolled with the broadsides and creaked in every plate

from their incessant hammering, for she was being driven sideways and forward from New Terre.

Quarter only in the light, the planet dwindled in size until Steve's practiced eye estimated her to be seventy thousand miles.

"Cease firing," he called into the phone.

Lessening her lurches, the *Fury* settled to the keel set of her gyros.

Steve slid down the long ladders from her observation turret and sought out the first gun manned. The young Son of Science there was dripping with the sweat of firing heat.

"What's your name?" said Steve. "Baldrin."

"Baldrin, eh? Knew a good officer by that name once. Baldrin, consider us a vessel in distress. There are about thirty kinds of high explosive energy aboard this ship. I want to know how you would go about making a long streak of fire which will travel through the sky, bright enough to be plainly visible for a hundred thousand miles against a black field of space, which will burn for four hours."

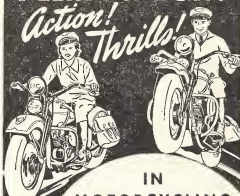
"Distress? You mean you think they'll come out and rescue us instead of blasting us when we go near?"

"That's it," said Steve. "That's it exactly. The code of space. I want about fifty of these streaks and I want them within the next thirty minutes. You!"—he motioned to a petty officer of the old crew at the next gun gallery who had crossed flames on his dirty sleeve—"you know the magazines and what they contain. Show Baldrin what he wants and have some of your men pack it. I suppose, Baldrin, you'll want somebody in space-suits to dump it through the place the tubes used to be."

"Yes. Yes, but—"

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"You'll think of something, I'm sure."

"But Professor Mauchard says that we must surrender because we can't maneuver to fight—"

"Well?"

"Oh. Certainly. I see. This is a surrender in a way."

"Now, let's get busy."

"I can mix—"

"Just mix it," said Steve.

BACK in the observation turret, Steve watched New Terre. Only a thin slice of its lighted side remained and that was slowly vanishing. Beyond it spun Procyon. The reflecting power of the *Fury's* hull was at a minimum for it had been set for yellow-white probably for months. Only a lucky detector could spot them at this distance.

In twenty-nine minutes by the observation turret clock the phone whirled. He saw Baldrin's grimy but eager face in the screen. "I mixed—"

"Good. Is it ready?"

"All ready."

"Fine. Knew you could. Now, can you put a delayed igniter in each sack? A small time cartridge out of a flame grenade is good enough. Set it for two hours and dump out the bags at one minute intervals."

Mystified, Baldrin started to question and then shrugged. He did not know the laws of space concerning distress.

"When I give you the word," said Steve, "begin to unload."

Steve switched to the main gun turrets. The face of a stolid range gunner appeared in profile. "You." When the gunner faced the panel, Steve said, "pass the word along to fire dark shells at a target dead ahead in our plane."

"Aye, aye, sir," said the range pointer with the air of one who cares not whom he serves, having confusedly served so many.

Through his phone, Steve heard

the word being passed. The dark shells had not much range or force but they were enough, for now the *Fury* was traveling at a slow speed. The first barrage, port and starboard, made the *Fury* jerk and buck. After that the ragged firing gave her no definite jolts.

"Cease firing," barked Steve into the phone.

He had gauged it nicely, for now the *Fury* was barely moving in relation to New Terre. At this rate it would take them a day or more to go around the planet at this distance.

"Can I start now?" said Baldrin, helmeted now for space and speaking by magnetic connection.

"Let them go," said Steve.

Looking aft and down the curved back of the *Fury*, Steve saw the first bag dumped. It expanded and spun away like a toy balloon which suddenly has its air released. After it went the other bags until, an hour later, all fifty of them had been unloaded.

Steve went below and met Baldrin coming through the ship, thanking him.

"Now, let's go forward and see Mauchard," said Steve. "Blacker, would you go along?"

THE THREE oddly assorted men worked their way toward the bridge. Baldrin, still in the wool under-jumper and pants of a spacesuit, too young to be easily wearied; Dave Blacker, stump of a cigar in his bulldog jowl, swathed by a tattered, loudly checked topcoat; Steve gaunt-eyed and strained, his slenderly aristocratic body engulfed in the Royalist spacecape, his pajama jacket girded about by a seargun belt, barefooted, jaw-line hazy with the stubble of a blond beard.

Mauchard let them in through the air lock when he saw they were only

three and flourishing no weapons. Mauchard was defiant, standing back against the maze of calculators which covered the bulkhead with oblong number slits. He waited for the three to speak, the while gazing coldly at the suddenly disconcerted Baldrin.

Steve sank down in the navigator's scuffed chair. He saw a bottle sticking its neck out of Blacker's pocket and took it out, offering Blacker a drink, unaware of the humor of it in his weariness. Blacker glowered a refusal and Steve drank.

Mauchard reached a point of strain where he had to speak. He singled Baldrin. "So you've gone over to them, have you?"

"He's gone nowhere save where you took him," said Steve, "wherever that might be."

"And I suppose that you are going to take us away from here," said Mauchard.

"Not without rockets," said Steve.

"What do you propose to do?" said Mauchard.

"Kill you as soon as we have time to do it properly," said Steve. "Your morphogene trick—" he choked a little and his face was pale. "Get off the bridge, Mauchard. Get off the bridge!"

"Them's my orders, too," said Blacker. "And I got two hunnert tough guys to back it up. Blow, brother."

"Not until I understand what you mean to do!"

Steve looked at Mauchard and Mauchard took two paces backward coming up against the bulkhead. He stood there for a moment and then, signaling his men to follow him, went into the air lock.

STEVE GOT UP and pushed young Baldrin into the communications



With studied coldness, Gailbraith gave his demands to the giant, while fiery trails arched across the vault of sky above.

cubicle. "Do you know anything about contacting another ship?"

"Well—yes."

"Then start trying to make such a contact on that spacephone. Use a linguasolver because those people or whatever on New Terre, don't speak our language."

Steve went out into the bridge. He threw the switches of the firing command board. "Stand by with dark shells. Guns one and two port fire on ninety degrees our plane."

The *Fury* slewed under the recoil and slowly swung her nose toward New Terre.

"One and two cease firing. Attention all batteries. Dark shells. Target dead astern. Fire at will."

The *Fury* picked up speed toward New Terre and the planet's gravity began to aid in pulling her down.

"Cease firing."

At a thousand miles a minute, the *Fury* plunged toward New Terre. The chronometer on Steve's right ticked off half an hour.

"Dark shells," said Steve. "Range minimum. Target dead ahead our plane. Fire at will."

Jolting unsteadily, the *Fury* began to slow down. Two spheres darted out of the low-lying atmosphere ahead and at wide distance on either side swooped up to parallel the battleship at a distance of three hundred miles.

"Contact," said Baldrin in the communications cubicle.

"Cease firing," said Steve into the master gun control phone. He went into the small room with Baldrin.

"We're commanded to halt by two ships."

"I saw them in the magnetigraph," said Steve.

"Are . . . are we going to try to fight it out on the dark side of New Terre?" said Baldrin with the usual abhorrence of crashing in the blackness, blind.

"Have you their return wave?" said Steve.

Baldrin threw in the switch.

"Ahoy the cruisers," said Steve, speaking through the linguaresolver which converted his words into universal electrospeech.

"Halt!" spoke the phone. "Approach nearer to Absolo and you will be engaged in battle!"

"We wish no battle," said Steve to the invisible commander. "Allow us to land, for we are disabled and we will explain our mission. We cannot maneuver to fight, as you should

AST—10



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be able to see. It is doubtful if we can handle our landing. Can you contact us and get us down."

There was a swift interchange between the two commanders of the space craft and a rapid contact with their base. In a short time the permission was granted.

TWENTY MINUTES later the *Fury*, which had been through so many strange experiences, was experiencing the end of another. Two spheroids had grappled her and now she was being eased down into a circular field in the blaze of landing lights. A swarm of beings surged out from the curved buildings and gazed open-mouthed at the battleship, pointing out huge tears in her bow and tail where their shells had done so much damage.

They were Mirionites, about four times the height of an Earthman. Steve had seen two of them in the triumphal parade of General Tars Golden after his return from the famous Orion campaign. He had been awed then by the furry, stilt-legged things, with their enormous ears and mouths and their tiny double eyes. They had had trouble walking on Earth because its gravity was greater than anything to which they were accustomed and they were having just that trouble on New Terre, or Absolo, as they called it, all of them carrying metal canes which were at once support and probably rapid-firing weapons.

A guard of soldiers, naked except for the metal cartridge bands worn on each bicep, assembled in brisk order as the landing ladder of the *Fury* dropped down.

Steve drew the cloak about him and stepped to the ground. The towering Mirionites looked wonderingly at him as a child might regard

an animated doll.

"Baldrin!" said Steve. "Hand down an instrument."

With the linguasolver he tried to make the officer in command understand him but the fellow shook his head, got down on his knees and hands and looked closely at Steve's face. Then he saw the linguasolver and called for one of his own. Crouched there he made signs that he was ready to listen through his instrument.

"Take me to your chief," said Steve.

"I cannot," said the Mirionite. "I have orders to arrest you. Why do you come down this way? We are at war with the Terrestrial Empire. We have destroyed its colony here. You are also to be destroyed."

"Destroy me and destroy yourselves," said Steve. "Take me swiftly to your chief."

"The governor is asleep."

"Then I shall awaken him," said Steve, and stalked down the ranks of knees in the direction where a glow showed against the clear sky.

"Wait," said the Mirionite. "I have orders for all Earthmen. I am—"

"I am an envoy. My person is inviolate. Touch me again and you will destroy Absolo."

"What is your business?"

"My business is with your governor, not with his lackey!"

"Envoy? From the Terrestrial Empire?"

"Certainly."

"If you lie to me, then you shall be killed with flourishes. Do not tamper with the law of the Mirionite. Earthmen are to be killed."

"Take me to the governor!" said Steve.

THE MIRIONITE pushed himself erect with his twelve-foot cane-gun and gave the order to lead off. For a little while Steve struggled to keep in the file, but the ground was rough and the soldiers marched swiftly. The captain at last shrugged and picked Steve up, holding him gingerly in the crook of his arm like one might carry a child who never has before.

The city was a series of smooth glass bubbles in the center of a ninety-foot glass wall. Solar storages gave off a glare of light. Neither shrub nor blade grew in this place, for the streets ran all about the homes and were soft as cloth with some dark fabric of chemical weave. Bars of light acted as fences, gates and doors, pulsating screens which dripped rolling sparks.

The business district was in silence, the marts labeled only by three-dimensional-color projections of goods on the areas before the entrances. A little farther along, female Mirionites and offspring peered frightenedly at the column which moved along the curving streets, until Steve was perceived and then a ripple of wondering and amused laughter followed.

Great sheets of scarlet flame crackled warningly before the compact group of hemispheres which marked the government place, zipping back and forth from either side of a circular series of posts which surrounded the place. The column paused on the heat-exuding edge of the live barrier, while the captain exchanged courtesy with the officer of the guard within. A space ceased to arc and the group moved through. The guard officer struck an invisibly suspended glass ball, which lighted and upon its lighting, caused a long series of such balls to bob and glow from the gateway on into the buildings. A sound of snapping within the hall of the first building ceased

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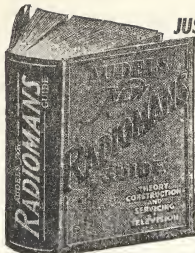
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and, by the jumping lights, soldiers stood up and craned to view whatever might be coming.

The captain who had carried Steve, had begun some distance back to show the effects of the effort, though he attempted to mask his heavy breathing. With the excuse of entering their destination, he set Steve down into the forest of stilt legs and flexed his aching arm. Steve was glad enough of it, for the captain smelled like a wolf's lair, uncleaned since the birth of the first wolf in evolution's chain. This palace smelled little better, but the acidity of brimstone took the sick sweet edge off the stench. Seeing the "tiny" being, some of the palace guards tittered.

The files halted and the captain glanced at the officer of the guard who had accompanied them. The latter went forward and a bright sheet of blue fire, which had been dancing before a circular door, ceased. The officer went in and a moment later petulant sounds came out. The argument was short and the guard officer stepped into the hallway to motion the files into the room.

It was very difficult for Steve to see anything, for the round furniture blocked his vision and the bed's base was too high for him to see anything of the governor but a pair of flattened ears.

Through the captain's linguae-solver and through his own, Steve heard the governor say, "Well? Well? Dromo, you know your duty. You know your regulations. You have heard my posted orders and the orders of the Multicouncil itself. And yet you wake me. You wake me! Before morning, too! If you cannot carry out orders, I shall have to put another in your rank! Now! Under the heading of Terrestrial Empire, what does the ordervoice

state? Quickly, now. What does it state?"

The unhappy captain screwed up his four glittery eyes, hunched his shoulders and let his ears droop. "The Terrestrial Empire Border must be maintained. Five scout cruisers—"

"No, no, no!" said the whiningly grieved governor. "Now you are trying my patience. What does it say with regard to Terrestrial People? Be explicit!"

"All People invading the domain of the Mirionite Multicouncil shall be drained of technical information and executed, to discourage exploration of the Multicouncil which does not desire war," parroted the miserable captain.

"There! There, you see? Was there any need of waking *me* just when I needed my sleep most? Give him to the Library Technicians and then to the Servant of Death. And go out of here and let me get my rest!"

"One moment," said Steve.

"What was that?" said the governor, lifting himself up and peering around.

"It was I, Emissary of the Mighty."

The governor took hold of the edge of the bed and put his face over the side to peer near-sightedly at Steve.

"Hmph," said the governor. "I had forgotten how insignificant People were."

Steve rummaged inside the military cape and found a sheet of paper he had scooped off the communications desk. It was a list of space-wave stations.

Shoving it up at the governor, Steve said, "I bring you a message. My space landing boat was shot up by your ignorant gunners when first

I tried to land. I am not a little angry with the impudence of your treatment of me. Please mend your manners and come to business."

The governor took the paper and squinted at it uncomfortably. As a learned Mirionite and as a governor, he felt that it should be in his power to read it, or at least that his officers and men would think it should be.

"Space lifeboat?" said the governor suddenly, registering Steve's remark. He reached up to the head of his bed and pushed a button which dropped a screen. He twirled a knob and the landing field came in focus. He stared at the *Fury*, looming above the Mirionite spheroids. "Space lifeboat?"

"I want no trouble with you," said Steve. "As you can see in that communication, I am an Emissary of . . . of The Comet, Spacemaster." He glanced impatiently at his watch. "His Mightiness, The Comet, will become impatient before long. He said that I should contact him concerning the acceptance of this mandate within three hours, and the time is nearly up. He does not trifle. If I do not report, he will know I have been killed and so set about the destruction of Absolo."

"Destruct— The Comet? I have never heard of this. What do you mean, destroy Absolo?"

"Just that. The Comet levies tribute on Absolo. The amount of that tribute is to be set by me. I am to stay here with my party until such time as he comes again. The Comet is the greatest space baron of all time and his fleet is of a size to engage and defeat the combined fleets of the Terrestrial Empire itself. If you want war, then you may have war."

IN STUNNED silence, the governor gripped the bed, the wave-length list

and stared at the "tiny" being who looked so ferociously at him. Then the governor relaxed. "I have seen nothing of such a fleet! You trifle with me!"

Steve did not look up. He pointed up.

The governor looked at the ceiling and a guard hastily threw a switch which removed the opacity of the dome. The strange constellations sparkled against the black night above. And more.

The governor gave a gurgling gasp.

Steve did not look up. He stood there, pointing confidently. And high against the zenith were the streaks of pale flame which would indicate a rocket fleet standing by.

"One, two, three—" counted the guard officer.

"I can count!" said the governor irritably. He punched a button and a strained Mirionite face came into the screen. "Radso! Why did you not warn me—"

"The governor's sleep—" quavered the face.

"Sleep! You would allow me to sleep with death over my head? How far away are those ships?"

"Our ranges indicate seventy thousand miles. Are . . . are you going to order us to f-f-fire? We only reach two thousand and we have just five scout cruisers on all Absolo, and it is nineteen days to our nearest b-b-base. And there are only seven cruisers there—"

"Are me dead," shuddered the governor, staring up through the dome from his bed. "Seventy thousand miles and they leave tails like that? Sir Emissary, you say you must report back and that it is nearly time?"

"Am I to report that you wish to be friends with The Comet, Master

of All Space, and that you guarantee the safety of his tribute commission?"

"Yes! Yes, certainly! S-seventy thousand miles and tails like that! A space lifeboat. Dromo, escort the Emissary back to his . . . his space lifeboat. Tell him and his friends he is welcome here. When"—and his eyes had a suddenly crafty gleam—"will he be back?"

"The day I do not send him a full report of our activities."

"Dromo! Dromo, give Sir Emissary a larger guard. Don't . . . don't let anybody step on him!"

"Thank you, governor," said Steve, taking back the message from the trembling hand. Dromo drew up stiffly and Steve walked nobly past the protruding knees.

SOME TIME later, aboard the *Fury*, when the Mirionites had finished squeezing through passages and the "space fleet" had "gone away," a haggard but grim Steve entered the cabin of Jean Mauchard.

"I suppose I owe you a deep debt for saving me from my folly," said Mauchard in a low voice.

"You owe me more than a debt," said Steve. "I have saved this ship, perhaps, but I have not saved you."

Mauchard started up from a chair. "You mean you hold the mutiny against me still? What else could I do—"

"To Ares with your mutiny, Mauchard. Down this corridor is the one who paid for your stupidity."

Steve's hands were shaking, but his face was calm. Nerve and hatred were carrying him to an impossible limit of strength. He took out his seargun and cocked in a new charge. "This is cold-blooded murder, Mauchard. I'm not above that now. I've sagged six runs below bottom

already. Not even your death can bring me any lower."

"What . . . what have I done? Who . . . who has paid?" For Mauchard could not have gone through the revolt without recognizing imminent death when he saw it in a man's eyes.

"Vicky Stalton died from the effects of your morphogene, Mauchard."

"Died? No! That's not possible! Colonel, listen to me. This is no bluff. It couldn't happen! Listen to me!"

"I've gone through the past many hours knowing what would happen to you, Mauchard. Squirm out of it if you can. I played this farce through, yes. But not to save you."

"Colonel, listen to me. You've got to let me look at her. That's all I ask. Just let me look at her and, if she died from the morphogene, then I know I must pay for it. But you can't condemn me until you let me see."

"All right," said Steve wearily. "Go look at her. Maybe it's more to the point to kill you there."

Mauchard went swiftly to a locker and pulled down a small flexoid case and then hurried on before Steve to Vicky's cabin.

She lay where Steve had left her, face covered, pale fingers showing. Steve stood in the doorway, seargun in hand, while Mauchard pulled back the cloth from her face.

But Mauchard did not seem to be interested in discovering life in her. Instead, he snapped open the case he had brought and took out a long needle to which he attached a tube. He nearly startled Steve into firing when he plunged that needle into Vicky's heart and depressed the plunger in the tube.

"Oldest scientific discovery in the book," grumbled Mauchard to himself. And then to Steve, "Morphogene is one of the gases used to



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bring about suspended animation. Some people are allergic to it. She'll come around in a few moments."

Steve looked from Mauchard to Vicky and then stood staring at the girl like one who has just come out of a horrible nightmare to the security of an understood room.

Vicky stirred a little and rubbed sleepily at her eyes, yawning. She felt her fingers crushed and glanced up.

"Oh. Hullo, Steve." And then, seeing how pale he was, "What's the matter? Gosh, Steve, are you seeing a ghost or something?"

"No, Vicky," said Steve with a sob. The seargun clattered to the floor at his feet. "Thank God, Vicky. No!"

THE END.

TWO PLUS TWO EQUALS 100

Counting by twos is normally somewhat of an unnecessary complication, but some primitive tribes, and some advanced scientists find it useful. Their method, however, runs to a straight binomial number system. That is, "one" is written, say, as 1. Two becomes—10. Three, of course, is two plus one or 11. And four, which is two (10) times two (10) equals 100. The numbers up to ten continue, in turn, as five = 101, six = 110, seven = 111, eight = 1000, nine = 1001 and ten = 1010.

Why would any modern scientist want to use so cumbersome a method of calculation? It comes in very handy in a special application; electrical calculating machines find it ideally adapted to the simplest of electromagnetic devices—the relay. The simplest type of relay has two positions—open or closed. By simply hooking up the circuits so that "open" means "0" and "closed" represents "1," a series of simple relays can operate directly and easily in the binomial number system. The resultant machine is bulky, but simple and positive in action.



BRASS TACKS

Ten best

Dear Mr. Campbell:

Reader's report on Astounding for 1940:

I. Best covers:

1. January—Schneeman.
2. April—Rogers.
3. August—Rogers.
4. September—Rogers.

II. Ten best stories:

1. "Final Blackout," by L. Ron Hubbard. It's a classic. Nothing of the same type will ever surpass it.
2. "Slan!", by A. E. van Vogt. I had great hopes for this story. It didn't live up to them. Surprise ending, all right, though.
3. "Requiem," by Robert Heinlein.
4. "Fog," by Robert Willey.
5. "The Stars Look Down," by Lester Del Rey.
6. "Vault of the Beast," by A. E. van Vogt.
7. "Hindsight," by Jack Williamson.
8. "The Professor Was A Thief," by L. Ron Hubbard.
9. "The Emancipated," by L. Sprague de Camp.
10. "And Then There Was One," by Ross Rocklynne.

III. There is no list of best illustrations. There were none. However, Schneeman's

improved now that his old style is back. It is one hundred percent neater, and I can find no lack of dramatic force.

But I can never count an issue perfect unless there is an illustration by Wesso in it. How's chances for a whole issue illustrated solely by Wesso and Schneeman?

IV. Best all-around issue: December.

Good luck in 1941.—Daniel King, Cragmor, Colorado Springs, Colorado.

The perfect rating method is yet to be devised. For one thing, how many readers does one letter represent? Some group-types tend to write in more than others.

ANALYTICAL LABORATORY:

DEC. 1940

1. van Vogt, A. E.—"Slan!"
Good story.
2. Richardson, R. S.—"Wanted: Suggestions."

Now that you've a method of evaluating rankings submitted by less than all correspondents, guess it's O. K. to rank articles in with stories now. Next to "Slan!", I enjoyed this particular article most.

3. Miller, P. Schuyler—"Old Man Mulligan."
4. Willey, Robert—"Fog."
5. Edwards, D. M.—"Spheres."
6. Bond, Nelson—"Legacy."

A comment on your rating calculation method: (An admitted impertinence, but correspondents to magazines seem to go in for impertinence.)

For that part of your contents ranked somewhere by everybody, the method seems entirely adequate for the purpose to be served. That is, I'd trust the novelettes and short stories to be correctly placed, relative to each other.

Occurs to me you may run into trouble if you use the method, unmodified, on data for which you have only fractional returns.

For instance, thirty-eight rank an unfinished serial, thirty-four putting it first, four second, zero less than that. Average: away up.

You average the largest number of returns for finished stories. One of these ranking third or fourth has actually received more than the thirty-four "first" votes which put your serial up near the top. Conceivably, another might average out to an apparent tie—based on many very high ratings by people who did not rank your unfinished serial one way or the other. That is, the statistical figure arrived at by the method would *look* identical. The difference is that this was computed from complete returns, the other from fractional (since the thirty-eighth ranking the serial ranked this story, too—but not vice versa).

What would you do then? Take the figure's word for it and mark it straight tie? What would you do in the other case—mark it third or fourth, disregarding the gross figures which show as high an incidence of top votes for that one, as for the serial? Or would you just go home with a headache?

Not that I really doubt that you have something up your sleeve to take care of just that contingency. The trouble, I imagine, is that "weights," the statistical answer, don't lend themselves to exposition in a short paragraph. Thank you for letting us in on the uncomplicated part, though. I've often idly wondered about the method employed—having played with and cursed statistics on occasion myself.—Verniaud.

Sequel's, to be satisfying, must be better than the originals.. I don't know whether "Slan" should have a sequel or not.

Dear Mr. Campbell:

Science-fiction enthusiasts in the Twin Cities would like to announce the formation of an informal independent organization to be known as the Minneapolis Fantasy Society.

Monthly meetings are being held at the home of its director, Clifford D. Simak. Other prominent members include, Carl Jacobi, Oliver E. Saari, Charles Jarvis and Phil Bronson.

Fans in the immediate area who are interested are urged to contact the secretary at the following address.—John L. Chapman, Sec., 1521 Como Ave. S. E., Minneapolis, Minn.

Twin Cities fans.

Dear Ed:

I have never written a letter to any magazine, but that last issue of Astounding made me come out of the cave.

Unquestioningly, "Slan" merits the Nova designation.

Without a doubt, undoubtedly, indubitably, "Slan" must have, needs, urgently requires a sequel, and that soon.

The last part of "Slan" left me breathless and I have already read it four times. The more I read it, the better it looks; not just the last part, the whole story.

How is the sequel to "Gray Lensman" coming along? Is it nearly finished? I hope you will print it soon.

I know that Astounding is tops in its field and I sincerely hope you will keep it there.—Frank Matanzo, Box 66, San German, P. R.

Harry Bates has another yarn coming up.

Dear Mr. Campbell:

Here are my favorite ten Astounding tales of the year. Not in order of preference, of course.

1. "Slan." Undoubtedly. After a thorough reading and general mulling over, I must confess that I can't be quite as fulsome as some of the Brass Tackers, but I do agree with your high opinion of it, and further agree that it's a classic. Still—the

first three installments had me on the edge of the chair, literally. The final chapters seemed to wane. Frankly, I must admit that I cannot state precisely why; all I know is that it didn't hit me right. There just wasn't the sustained fervor about it. It did tie up all loose ends; it offered a satisfactory explanation. But something was missing. It was as if Van Vogt had suddenly lost the meter of it and was limping along, valiantly, trying to regain it. The only comparison I can offer is that of hearing Toscanini conduct Ravel's "Bolero." It starts off well enough, but along toward the middle you feel that the maestro's heart really isn't in it; you get a feeling of restraint and general frustration; where the rhythm and melody are supposed to be expanding, rising, the drumbeats actually palpitating, you feel a hiatus. And finally the whole effect is one of straining at a leash; one feels that the whole orchestra is being muzzled just when they should be given full sway; because of the increasing sway of it, you are far ahead of the orchestra, beating it out yourself, grinding your teeth as you wait for the players to catch up. But they never do. The piece comes to an end and you are left stranded, unfulfilled. That is an exaggerated comparison, but it is the only way I can describe my reactions to the last installment of "Slan"; perhaps you can tell me why; I can't.

On the credit side, Van Vogt has done admirably what few stiff writers with a mutant or nova story have been able to do: portray a future environment without merely placing today's people, their ideas, senses of value, and reactions into the next century, or whenever it is. Of course, a full realization of this is impossible, but Van Vogt succeeds to a very large degree.

One thing more comes to me: that is, to my taste, Kathleen was overemphasized, while Joanna Hillory, a much more real character, who should have been the heroine—damn that stupid term!—was left out in the cold. Yet, to have done so, one supposes, would have been, in effect, to have abandoned the necessary approach to the superman—another abused term—tale which alone made "Slan" a classic. Enough of this: I read the story and delighted; let it go at that.

2. "Coventry." One is constrained to wonder why, under such a type of society that Heinlein presents, there would be such misfits as our hero. Why, for example, with the entire complex, educational and otherwise, which alone could make such a social-moral—Chase ho! These tyrannous words!—set-up possible, that people would be frustrated to the point of rebellion. Anti-

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social acts, no matter how slight, are rebellion against the society in which one lives; the world outside of coventry realized that this was the crux of the matter and that the degree of outburst meant little. But, again, a thoroughly enjoyable tale; one which made me engage in what I like to call thinking.

3. "If This Goes On." Heinlein's real. To say any more would be slobbering.

4. "Vault of the Beast." A formula tale which makes you forget the fact that it is so.

5. "Crisis in Utopia." This did not quite live up to advance expectations, yet is memorable none the less. I'm purposely refraining from looking through my copies.

6. "Final Blackout." As I mentioned above, these are not in order of preference. As a piece of literature, I'd normally rank it next to "Slan." Yet—is it really science-fiction? I'm not answering that question, merely asking it. Is a story which can have no more claim to being stf than having its occurrences take place in the future to be called that? It hasn't happened yet. But that is all. Fine characterization and, though I disagree heartily with Hubbard's conception of history and politics—as evidenced by this tale—still it's one to be reread, even after the course of events has made many of its episodes rather ridiculous.

7. "Farewell to the Master." I wish one saw Bates more often—up to this standard, of course.

8. "Homo Sol." Very neatly done; I think Edna St. Vincent Millay once remarked that a person who has not been bludgeoned into profound admiration and delirious enjoyment at some item from the pen of one who, up to now, has been thought of as the most sickening writer on the face of the earth, just hasn't lived. While my opinions of Asimov's earlier writings hasn't been as low as that, still the analogy is usable. Swelegant!

9. "Roads Must Roll." Psychological tales are my meat; Heinlein again!

10. "The Exalted." Exactly!

On the other hand, some of the duds, for my two dimes, were: "The Idealist" stories, "Spheres," "Fog," "Deputy Correspondent," "The Carbon Erate," "Runaway Cargo," "Space Guards," and "In the Day of the Gold." Others which might not have clicked with your humble and obedient servant just didn't displease enough to be memorable.

Art work? Covers have been nifty, except for the January, 1940; same interiors. Sorry, but I don't like most of Scheeman's stuff these days. Not imaginative. In the

line of drawings for "Red Death of Mars," "Old Man Mulligan": yes. In the line of drawings for "Blowups Happen," "Slan"—most of them—and "Final Blackout"—effective as some of them were!—no. R. Isip is delightful; Kramer the opposite. Orban usually O. K. As if all this mass of opinion on the part of a single reader mattered!

Finally, as one-time official connected therewith, let me thank you publicly for your kindness and co-operation in donating originals to the Chicago Stf Convention of 1940, and for aiding same by advertising in the official program booklet. We missed you there; I'd hoped to see you and Doc Smith exchange diverse comment as of yore—remember the days of your glorious feud over the alleged—who *did* win those battles?—chemical vagaries in "Skylark of Space"?

Thus, with general feelings of appreciation and good will to the editor—and apologies to Brass Tacks readers for abundant use of the first person singular, sincerely—Robert W. Lowndes, 129 West 103rd Street, New York, N. Y.

*Got it early? No reason I know of.
You're just lucky.*

Dear Mr. Campbell:

Carl Anderson can go to, as Shakespeare saith. I think that Astounding has come a damn sight farther in 1940 than in 1939, and none of it was backwards. Furthermore, the February issue of Astounding has everything in 1940 beat all hollow, excepting, of course, "Slan," "Final Blackout," and "Gray Lensman." And I haven't read "Magic City" yet, nor have I finished "Completely Automatic." "Sixth Column" is another one of those yarns that gets better—very much better—as it goes along.

About Odorated Talking Pictures: The gadget is electrical in nature and acts on the schnozzle nerves. The inventors have been working on OTP intermittently for about eight years, after one of them stumbled on the secret in a lab accident. The gadget has to be electrical, because it would have to be cut on and off quickly when changing scenes, and there is no scene "fading," with regard to smells. If it were chemical in nature, rather unpleasant by-products might be created, and any oxides, et cetera, that were created would fall, like snow, rain, or maybe hail, on the audience. And, a bit of H_2S might turn up while shifting from one odor to another? I hope

that when OTP goes into commercial* production, someone will have the common sense to run a smell commensurate with the quality of the picture during the introduction! Sample: Chanel No. 5—or Berbelot's Doux Reves—for a 4-star, something more bourgeois for a 3-star, a rather neutral smell for a 2-star, H_2S for a 1-star, and eau de polecat for a 0-star film.

Why is it that I was able to get the February Astounding on January 9, a week earlier than it's scheduled for national distribution? That's the second time such a thing has happened to me, and it has me wondering.—Charles J. Fern, Jr., Atherton House, University of Hawaii, Honolulu, Hawaii.

Well—Quintius Teal was a remarkable man; remarkable things must be expected of his efforts.

Dear Mr. Campbell:

Ratings for February Astounding—

1. "—And He Built a Crooked House"—A+
2. "The Best-laid Scheme"—A
3. "Sixth Column"—A
4. "Completely Automatic"—B++
5. "Castaway"—B
6. "Trouble on Tantalus"—C
7. "Magic City"—C--

As you predicted and as I expected, "Sixth Column" improved considerably; and altogether this was a pretty good number. But it was ruined by the novelettes, both of which were pediculous, puerile, pedagogical productions of almost anthropoid authors. Not only that but they stunk.

I'll admit that "Magic City" was at least baffling; I couldn't tell whether it was *meant* to be thrilling, impressive, pathetic, funny, or what. I'd say it wasn't anything but overdone. The other novelette was a bit turgid, not at all realistic, and very corny. Please do something about the long-shorts.

Well, everything else was good and the Klystron article was super. Now, about Heinlein's little tale. As you'll notice by my rating, I liked it plenty. But Teal had remarkable luck—though I guess it was bad—that the house did what it did. Try cutting out of paper an unfolded cube and laying it on the table. Then bang the table with your fist, and 1,000 to 1 it doesn't jump up into a cube; although I guess if it did it would come to rest lying on one of its faces, as the house did in the story.

Of course, all the geometry was theoretical, so there's no sense my arguing.

Let's have more Heinlein, the screwier the better; more de Camp, the funnier the better; and more van Vogt, the better the better.—Chandler Davis, 309 Lake Avenue, Newton Highlands, Massachusetts.

SCIENCE DISCUSSIONS

So that's how they got those Mars photos!

Dear Mr. Campbell:

The short article by Mr. McCann in the February, 1941, *Astounding* was quite interesting and is correct, as far as it goes. However, it seemed to me that it made out a somewhat worse case for observation than really exists.

Take the so-called "canals" of Mars for example. Actually, they are NOT extremely difficult to see, under the best of conditions. Many of the more prominent ones have been photographed many times. It is not the existence of linear markings which is questionable, but the nature of those markings.

During one of our visits to Lowell Observatory, shortly after the last opposition of Mars, we had the privilege of examining some remarkably fine photographs of Mars which had been made by Dr. E. C. Slipher in South Africa. These photos showed the linear markings so much more clearly than any we had ever seen before that we wanted to know how it was done.

The explanation was really quite simple. Just another case of detouring around an obstruction that could not be removed. As Mr. McCann explained in his article, air tremors blur the image produced by a telescope. As a photograph always requires at least a little time, the resulting image is always more or less blurred. By using a low magnification, the image is small and bright, which permits a short exposure. The shorter the exposure, the fewer the wiggles. BUT, the image is small. When that small image is highly enlarged, the grain of the plate becomes painfully evident. Fine detail is lost in the fog of silver granules. In order to take advantage of the sharper images obtained by short exposures, it was necessary to resort to a trick which would reduce the effect of the grain of the plate.

This is done by printing, not from one negative, but from six. Two or three dozen photographs of Mars were made in rapid succession on the same plate. Of all these images perhaps half a dozen would have been made during the intervals between wiggles, and would be noticeably sharper than the others. One of these sharp images would be placed in the enlarger, and printed for 1/6 the time required to make a print. Then another of the sharp images would be moved into position, carefully adjusted to register with the first image, and another partial exposure made. This is repeated until all six images have been used. The idea is that the silver grains of one negative will not form exactly the same pattern as those on another negative. The result is that any accidental marking on one negative will not be exactly repeated on another negative. On the other hand, any marking that is actually on the planet, will be in the same place on ALL the negatives.

When the resulting enlargement is developed, the actual markings on the planet stand out with startling clarity, and the effect of the grain of the plate is almost entirely eliminated.

We compared some of the prints made by this method, with some of Lowell's drawings, made many years ago, and they match almost exactly. Illusion may, and frequently does, enter into visual observation, but one cannot photograph illusions.

As to the nature of these markings on Mars, that is another question. Whether they are natural or artificial remains to be settled, but that the markings exist is no longer in doubt.

I have been too busy at optical work to do any writing for sometime. Since I last wrote you, we have built two Schmidt cameras, one of which is now at Lowell Observatory. The other, just recently completed, is now set up at our Alpine station. Bad weather has prevented our using it to any extent, but we have hopes of getting in some observing soon.—Harold A. Lower, 1032 Pennsylvania Ave., San Diego, California.

So they've already developed a meteor detector!

Dear Mr. Campbell:

From the results the R. A. F. have been obtaining with their electrical enemy-airplane detectors, it looks as though space-

ships, when, as and if, won't have to worry about developing meteor-detecting devices.

The Nazis were outstandingly successful in practicing their theory that the best way to fight an enemy air force was to catch it on the ground and bomb it—until they tackled England. In Poland and France, what air force the opposition had was almost entirely destroyed before it could get into effective fighting position by surprise bombing raids that caught them with their pants down—"pants" being the term for those streamline housings put on retractable landing wheels.

In England, however, it was no dice. Every time the bombers arrived they were met by a highly active air force very much in the air, and not at all bombable. The Nazi force, having run heavily to bombers and not so much to fighter planes on the basis of the catch-'em-on-the-ground theory, was rendered unhappy.

A radio-electrical widget seems to have been largely responsible. It was quite capable of detecting the approach of enemy bombers while they were still some fifty miles deep in France, on the other side of the Channel. It detected them and, furthermore, plotted their course, approximate number, and speed of approach. Opposition could, then, be gotten into the air, put on their route to intercept them, and sent in appropriate numbers before the raiders arrived. And that ended daylight bombing. Night bombing remained possible because night fighting remained impossible.

Basically, the detector seems to consist of an ultrashort-wave transmitter and a series of receivers. They work on about the wave length used by television sets. The radio waves are so short that they can "illuminate" the enemy planes. A situation curiously parallel to that of the optical microscope arises in this radio detection.

Normal broadcast waves lengths are so great that they simply go around a plane, unimpeded, much as long-wave light goes around, without illuminating, very minute

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microscopic subjects. In the microscopic world, electrons have been used in the electron microscope to give the illumination where light misses. In using short-wave radio, the same effect is attained; the ultra-short waves "illuminate" and are reflected from the planes. Then, a "telescope" capable of "seeing" planes so illuminated readily picks them up.

The telescopes are specially designed receivers with carefully balanced circuits that are unbalanced when a plane enters their field of activity—a very large field indeed.

Evidently, this same general type of device could be used with even greater success in empty space to detect larger meteorites. Using the ultra-ultrashort waves that a klystron can generate, bodies down to an inch or so in size could be illuminated. In the total absence of interfering fields—no cities, gas-holders, et cetera, to confuse the issue—a range of several hundred miles would be possible, even with present equipment. With the improvements to be expected in the normal course of events, a range of a thousand or more miles is reasonable. Automatic electron-tube devices could calculate—by balanced fields reacting in millionths of a second—the approximate course, and avoid collisions.

John Berryman's "Special Flight" becomes quite reasonable, but for one general type of flaw. Berryman suggested mechanical calculating machines and course plotters. Such devices would require a total time of not less than thirty seconds—five for setting the data collected by the detector into the calculator, ten or more for actual calculation as an absolute minimum, five more for activating the gasoline-oxygen rockets, and at least ten to permit the ship to move in response to rocket thrust. At forty miles a second, a meteorite would cover one thousand two hundred miles in that time. In one thousand two hundred miles of space occupied by a meteor shower there would almost certainly be a dozen or more meteorites. The calculating machine would be apt to suffer a severe nervous breakdown due to inability to make a decision as to which one to calculate on first. And, of course, if it did decide it might calculate on the nearest, or largest, only to find that it was the smallest and farthest—that was headed for a dead-center impact.

In one thousand two hundred miles of ordinary space, there would normally be no inch-diameter meteorites; rocks that big are exceedingly rare. It's quite possible England's Nazi detector may turn out to be what the doctor ordered for meteor-dodging. Sincerely—Arthur McCann.

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